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EDITORIAL.

CRIMINALOIDS AND RESPONSIBILITY.

Criminaloid is a dangerous and useless term invented some time ago by Prof. Edward H. Ross, the well known sociologist, to describe what he believes to be a distinct class of men with moral insensibility, men who are mentally so constructed that they do not realize the criminality of certain business transactions. They often become rich, influential and leading citizens, but their wealth is "tainted" with shady practices. As a matter of fact there is no difference between them and the recognized swindler or ordinary criminals who are all perfectly aware of the harm they do to others. There is a certain standard of honor even among professional thieves, and it is no wonder that the borderland types should occasionally be patterns of virtue in domestic and church life, even abstaining from alcohol and tobacco.

Perfect morality is never found because it is unnatural. Our moral standard is something beyond our reach and we constantly strive for it. That is, we are all potential criminaloids if there can be such a class. The term is unscientific and should not have been taken seriously. This does not mean that the average man does not love righteousness for its own sake, but it does mean that what we consider righteous is that which experience shows is personally and socially best in the long run.

The responsibility for criminal conduct seems to be the point raised by the new term criminaloid. There is an implication of irresponsibility for they are said to be not criminals but like criminals. Therein is the danger. These men are as responsible as any other free person who claims and exercises the right of being at large. If they blunder into crime they must take the consequences. No man can be entirely altruistic or he destroys himself and family, nor can he be wholly selfish for he injures those upon whom he depends. Proper conduct is a nice adjustment of the two, in accordance with the natural law of mutual aid.

Criminal acts are merely those selfish ones which unduly ignore the rights of others and being devoid of all altruism are the result of defective judgment. Merely because a man has been successful in acquiring riches is no reason to excuse him from punishment, any more than a common burglar caught with the goods. Unfortunately the influential "business man" and the influential burglar often use money to escape the punishments due them for defective judgment. Yet unless there are sufficient deterrent punishments, the vast majority of mankind would be criminal. It may be harsh to say that every man has his price, but it is a fact that we all do that which we think is the least harmful or the best in the long run for ourselves. Moral behavior is often—too often —due to a fear of consequences of immoral conduct, although as said before we all strive for righteousness. Criminals do not look far enough ahead, their price is too low, they are too selfish to be tolerated in civilized society, they struggle for existence in prehistoric open warfare on others, they are parasitic instead of competitive, and must be eliminated whether they are burglars or bank presidents.

All questions of actual criminality and the potential criminality of those whose forethought makes them moral for fear of consequences are thus intimately bound up with psychology and psychiatry, two subjects with which every general practitioner should be thoroughly conversant. It is high time, therefore, that the medical profession as a body take part in all reform movements for they are the natural leaders by the very circumstances of their calling.

THE INSANITY OF OUTDOOR WORKERS.

The excessive number of insane among outdoor workmen is one of those startling things now and then discovered among the dry details of official reports. The New York State Commission in Lunacy in its eighteenth annual report, which includes statistics to September 30, 1906, has tabulated the relative frequency of mental disease among various classes of the population, and groups the mechanics according as they labor indoors or out. The chart shows that the indoor workers furnish far less than their share of insane, while the outdoor workers furnish an enormous excess, "laborers," for instance, have a percentage three times their share. It is stated that possibly the physical hardships and low wages of this class are the causes of the strain, yet this cannot be true because the vast majority of factory employees are very poorly paid and live under great hardships, while some of the outdoor mechanics are among the best paid. Contrary to the general impression, agricultural and pastoral employments furnish less than their proportion. Isolation

of country life does not cause an undue number of cases, nor do its physical hardships and poor income.

The mental inefficiency of unskilled laborers is undoubtedly the cause of their greater susceptibility. They are men unable to learn or practice a skilled employment. Many have given up and sunk to common labor, while others never made the start, being congenitally defective. Their irregular lives and periodical excesses are results of their small mental calibre and congenitally-warped brains, but in turn are also causes of the subsequent mental diseases; for such men are peculiarly susceptible and break under adversities that the better endowed endure. The educated furnish less than their share and the illiterate more, for another table of statistics of nearly 100,000 cases shows that only one-half had a common school education, less than 5 per cent. had a collegiate or academic course, 18 per cent. could merely read and write, 3½ per cent. could read, 8 per cent. were wholly illiterate and 17 per cent. were unknown. As it is known that children drop out of school from mental incapacity more than from necessity to go to work, it is quite evident that possession of an education is evidence of the possession of a brain which resists mental disease. It is not necessarily true that education of itself is a preventive, except in so far as it keeps the brain in healthy activity. Yet all that does not explain the great susceptibility of outdoor skilled workers—rather mystifies it, in fact. They are above the average in intelligence and education, yet furnish nearly double their share, while the indoor workers furnish only about half of their proportion. As far as known, the two classes are of the same mental calibre, given to equal excesses and irregularities. Moreover, the physically strong tend to robust outdoor work while the weak flock to indoor sedentary trades, and this still further darkens the mystery. Everything is in favor of the outdoor mechanic and yet he is injured by some factor from which the indoor laborers and farmers are shielded.

The relative wholesomeness of urban and rural outdoor life will probably explain the remarkable paradox. It is a well established fact that an unsuitable climate affects the nervous system of only those who expose themselves to it—self-evident as that may seem when thus so simply stated. That is, a white man in the tropics will preserve his health a long time if he houses himself in the hottest and lightest part of the day, to escape the well-known dangers of excessive heat and light, but he who works out in the sun from morning to night is soon a nervous wreck, if not a mental one also. The American climates are far different from our cool, shady, ancestral ones in Northern Europe, and the two factors of heat and light are far worse in the streets than in the shaded farm yards. Rich city dwellers who become nervous wrecks, are promptly sent to the cool, shaded country to regain health, and go there every

summer sick or well; but the poor mechanic must stick it out, as his busy time is in the summer, and he must run all the risks of sun exposure, from which the indoor workers are protected. Here, then, is another big field for subsequent investigation, to prove conclusively why indoor labor, so dreadful as to tuberculosis, is so beneficial as to mental health. What is needed is a study of the months in which these various classes break down, for if there is a great excess at any season it may indicate the causes and lead to measures of prevention. A tabulation of complexions would also give a clue, for if blonds are more susceptible in any outdoor trade it indicates light injury to which the brunettes are more or less immune. It is already known that the blond type does not stand urban life, either here or in Europe, nor can it stand crowding. The survivors of tenement life are largely brunettes. It is also well known that in a given condition of heat and light the blonds suffer more than brunettes from nervous and mental diseases.

THE PROTECTION OF THE PUBLIC HEALTH.

A bill concerning the protection of the public health by means of increasing the scope of activities of the Public Health and Marine Hospital Service, was introduced in the Senate of the United States by Mr. Gallinger on March 13th, 1908. This bill was introduced into the House of Representatives by Mr. Hepburn. It has been read twice in the Senate and referred to the committee on Public Health and National Quarantine.

To medicine in general, this bill bears most important relationship, as the duties therein imposed upon the Marine Hospital Service are of the most wide-spread and important influence. The Marine Hospital Service will be instructed, provided the bill becomes a law, to make special investigations into the prevalence of tuberculosis, typhoid fever, rabies and other diseases affecting man; to study the conditions influencing their propagation and spread and the methods necessary for their prevention and suppression. It will require that the health authorities of the various states, territories and District of Columbia, detail officers to coöperate with the authorities of the Marine Hospital Service in their measures for the protection of the public health. The Surgeon General of the Marine Hospital Service shall publish and disseminate sanitary bulletins and exhibits of practical information concerning the prevention of communicable diseases.

It is clear to almost anyone who has investigated, or who comes in contact with an epidemic, that the local public health authorities know little or nothing regarding the management and isolation of infected districts. To this end the bill under consideration provides that a school

of hygiene shall be established which shall be associated with a hygienic laboratory, and at which state, county and municipal health officials may be given a thorough course of that special instruction which should be utilized in the performance of their official health duties.

Another important feature contained in this bill is that which pertains to the investigation of the pollution of interstate waters, as it affects the public health. It recommends the appointment of a sanitary engineer who shall be competent to solve technical problems connected with the purification of water and sewage. The bill provides for the calling of conferences at Washington where matters of interest to the public health may be discussed by the health authorities.

A bill which contains so much of good as this, a bill which has as far reaching influence for the betterment of our public health, and which will put into the hands of those specially trained for the work, the management of conditions that so profoundly affect our national welfare and commerce, should surely meet with the unanimous support of medical men throughout the country. To us it seems highly advisable and proper that any influence which can be used or directed by physicians to help in the passage of this bill should be exerted.

THE PLAGUE ON THE PACIFIC COAST.

The plague in San Francisco should cause no alarm if the health authorities will continue to publish the true facts as to the situation. It was only when the notorious Schmitz dishonorably denied its presence that the public elsewhere became worried and ceased to visit the coast, to the injury of those very tradesmen who were demanding suppression of the facts. It is, unfortunately, true that the warfare conducted by Passed-Assistant Surgeon Ruppert Blue, of the Marine Hospital Service, has so far failed to wipe out the disease; but that was to be expected, as the infection was so wide-spread and the rats were carrying it far and wide, creating new foci every day. In time the disease will disappear, as it did from Manila under similar management, and Manila is a far worse field to deal with than San Francisco. It is primarily a rat disease and man is only an accidental host, though no one seems to know what part of the world is the permanent home of the bacillus. It is somewhere in Eastern Asia, just as the comma bacillus is a native of India, both occasionally starting out on world travels only to die out in time.

The role of the flea as plague carrier seems to have been conclusively proved by the British Plague Commission in 1905. The experiments were quite ingenius and showed that animals protected from fleas did not contract the disease, though kept in cages adjoining the infected animals, but that when infected fleas were introduced the disease was con-

tracted. Moreover the bacilli were repeatedly demonstrated in the contents of the alimentary tract, and the feces proved infective. The bite itself is harmless as the mouth parts are sterile, the infection being probably an inoculation of flea feces into the bite by the act of scratching. According to Major A. H. Moorhead, I. M. S., the cat flea (pulex felis) does not transmit the disease, and the human flea (pulex irritans) does so only very rarely. The main species are the rat flea of India (pulex cheopis) and the rat flea of north Europe (ceratophyllus fasciatus). These facts show that, when properly clothed and cleanly in habits, there is exceedingly little chance of humans contracting the disease. The oriental native is partly naked and thus more exposed, and the fact that the bubo generally appears in the groins shows that he is infected on the legs. If he bathed frequently it is quite likely that he would wash off the germs even if he were bitten. In addition, if everyone will keep his own house free of rats he will be exposed to little or no danger of contracting the disease, but a flea-ridden hut is of course fatal. Indeed a word might be said about scratching, or rubbing, itching spots in time of plague, for it is well to remember that it might be a flea bite which we are inoculating ourselves. It is found that the bacilli cannot live a saprophytic existence and are so delicate that they die within twenty-four hours after expulsion from the body of the flea. Infection in a house exists not on the walls or floors, but in the bodies of fleas which have bitten diseased rats. Disinfection is the act of killing these hiding animals.

Opposition to rat extermination is now and then expressed by physicians lacking knowledge of the facts. Of course rats can be exterminated permanently in only one way, and that is by being so clean as to our waste disposal and so careful in protecting foods, that the rats have nothing to eat. They are scavengers existing for man's benefit, and the experience of Japan is to the effect that after a rat crusade neighboring animals quickly invade the clear area and increase to the limit of available food, but that does not disprove the necessity for killing every rat we can when plague exists, for we are thus removing the sources of the infection. In time the bacilli lose their virulence and die out. Apparently they can exist permanently only in their native land, wherever that is. Nevertheless, the failure to eliminate the plague in San Francisco might be due to the fact that infected fleas are not killed in the houses harboring diseased rats. It does seem that disinfection must be directed against them, in the same manner that disinfection in yellow fever is directed against the mosquito. The patient in each case is perfectly harmless, and isolation is merely to prevent insects biting him. People need not be afraid of visiting the Pacific Coast. Open dangers are easily avoided and as long as the authorities continue to take the public into their confidence, trade

will not suffer. But if they begin concealing the facts, then is when alarm spreads and commercial disaster results.

The Plague Commission also discovered that there is a chronic form of rat plague, in which the bacilli reside in the abdominal lymph glands and slow abscesses and that quite a percentage of rats recover. This should have been expected for it is one of the axioms of biology that a pathogenic organism, to survive permanently, must not kill all its hosts or it destroys its own food supply or dies before it has a chance for transfer to a new host. For these reasons the rabbit diseases introduced into New Zealand failed to kill off the rabbits. As in the case of tuberculosis and leprosy in man, the plague bacilli have established in these rats a beginning of "tolerant immunity" as described by E. Lay Lankester, and are virulent only when they attack races which have not yet been infected. As it is not a human disease primarily, man never will achieve this tolerance and it is doubtful whether our rats will either, as they die too quickly and in such a large percentage. The cholera bacillus has never yet established itself permanently outside of India, as the environment eventually kills it, and there is as little chance of the plague bacillus becoming a permanent American resident. The advantage of modern sanitation is its ability to kill the invaders promptly and save the enormous mortality sure to happen while the bacilli are dying out in the old way of gradual loss of vitality. So let the rat and flea crusade continue.

RECENT ATTACKS ON SANATORIUMS.

The reaction against the tuberculosis sanatorium is quite natural but need cause no alarm. The pendulum of opinion swings because some great man, by an epoch-making discovery, moves the support to a new position. The pendulum follows but swings past the perpendicular and though it swings back it eventually comes to rest in the position the great man intended it should, and there it is kept at rest by the conservatism of mediocrity until some other great man pushes the support on again. Conservatism is the inertia of public opinion which is therefore always difficult to move and also to be stopped. Indeed it sometimes seems that "opinion" in or out of the profession is like dead matter—powerless to change its condition of rest or motion.

The sanatorium was designed merely to remove patients from deadly conditions and yet the idea grew up that it was essential and the recoveries were permanent even if the cured returned to the conditions which caused the original disease. The pendulum swung too far and is now about to start on its return stroke and we must expect to hear de-

nunciations of the sanatorium; indeed it has already been roundly abused by one French physician.

The reduction in tuberculosis mortality began over fifty years ago in England when the yearly death rate was forty per ten thousand population, but it has steadily declined until it is now less than 11.5. Dr. Bulstrode of the English Local Government Board, who made the recent report on sanatoria, shows that these institutions have not influenced the decline in the least. In addition he gives some rather painful statistics of the early death of the great majority of patients discharged from English sanatoria. Such results are inevitable unless the "cured" avoid the life conditions which originally broke their resistance. Home treatment is so perfected there should not be such relapses nor indeed is institutional treatment so essential as it once was when we could not remove the harmful conditions from the patient but had to remove the patient from the conditions. Nevertheless the sanatorium has come to stay, for it has proved its usefulness in permanently curing those who were willing and able to keep up proper living after discharge. It cannot accomplish the impossible, and the present reaction will only settle the pendulum of professional opinion in the right place.

LITERARY NOTES.

M. Vannier has recently contributed to the Bulletin Médical de l'Algérie, an erudite paper on the pharmacology of Algiers and Tunis, in which he describes, in detail, the curious magic practices which still obtain among the people. The most widely known of the extolled magic methods is the amulet, the writing on which is supposed to be done with ink of a decidedly sympathetic nature. These amulets, pledges of health, are bits of paper on which the priest writes a verse from the Koran. They are square or triangular in shape, are supposed to be imbued with all the virtues of the Sacred Bird and must be eaten in case of fever; burned and the ashes swallowed in case women wish to become pregnant; placed in a small metal box and suspended in close proximity to the affected part in inflammation of the lungs, and, when there is no disease to combat, are pledges of a continuance of health. All Arabian women and most men are happy possessors of amulets. The following is a translation of the writing on one of these amulets: "Treatment for those who have weak sight. Eat the heart of a pewit mixed with money, or better still, char its head, pulverize it and prepare as a collyrium. This will have a salutary effect. * * * * For a cough, chra a pewit in a pan, flesh, bones and feathers, and mix

with honey. Pills made of this and taken once a day will cure, provided God Almighty is propitious." To show that the pewit is not the only bird held in high esteem, the clever writer of the lines adds, "the owl has the same remarkable qualities, and, prepared in the same manner, will not fail to cure the many diseases which afflict mankind."

Albert and Alexandre Mary, the well-known French disciples of the German biologist, Ernest Haeckel, have recently published through the publishing house of J. Rousset, Paris, 1907, a book entitled "Evolution and Transformation: The Secrets of Life" (Évolution et transformisme. Les secrets de la vie), in which they declare themselves anew staunch supporters of the monistic doctrines peculiar to the writings of Haeckel. The articles pertaining to evolution and transformation contain their latest researches on the protameba nebulosa, protogenes and protomyxa; and a study of the monera, the real basis of the biologic evolutionist. According to Huxley, Haeckel "conceives that all forms of life originally commenced as monera, or simple particles of protoplasm, and that these monera originated from not-living matter" and though we have for some time accepted this as a theory, the authors of this new book show how by ingenious reasoning and experimentation, they have arrived at certain facts upon which the views of Haeckel may rest with considerable certainty.

An arresting book for the student who is interested in the origin of surgical instruments is John Stewart Milne's "Surgical Instruments in Greek and Roman Times" (Oxford University Press, New York). In the comparatively short space of 173 wide-margined and large-printed pages the author has succeeded, by a direct literary style, and an excellent judgment as to what best suits the Anglo-Saxon student of medical history, to fashion a book that is stripped of all extraneous matter and is not burdened with the author's own opinions. That his sources of information are the best—Brunner's Die Spuren der römischen Aerzte auf dem Boden der Schweiz, Deneffe's Étude sur la Trousse d'un Chirurgien Gallo-Romain du III Siècle, Adams' translation of Paulus Aegineta and the papers of Vulpes—that the photographs of the instruments are of the highest artistic standard, and finally that erudition is made the means of engaging writing and not the agent of a prolixity almost maddening, should invite the earnest attention of all who are interested in something more than the mere practice of surgery as it obtains to-day.

In a recent number of the *Archives d'électricité médicale* a contributor prints statistics in regard to the quantity of radium at present in the

world. On all sides we often hear that in the whole world the quantity of radium amounts to less than a gram. Small as this amount must seem to the uninitiated, it is really in excess of the truth as near as we can get to it by examining statistics which proclaim exactly the manner of its distribution. The subjoined list, taken from the French journal, gives an excellent idea, not only of the quantity of radium as it exists to-day but its division among certain scientists:

Mme. Curie	15	milligrams.
Sir William Ramsey	20	"
Sir William Crookes	20	"
Prof. d'Arsonval	20	"
Prof. Bordas	10	"
M. Becquerel	10	"
Thomas Edison	20	"
Other owners, doctors for the most part	20	"

As to commercial radium, the strength and activity of which is very variable, it is well-nigh impossible to form any statistics for the reason that it is so widely distributed. But this we do know, that the quantity of pure radium contained in the commercial sort is much less than is shown in the above table.

M. Vannier has recently contributed to the *Bulletin médical de l'Algérie,* en erudite paper on the pharmacology of Algiers and Tunis, in which he describes, in detail, the curious magic practices which still obtain among the people. The most widely known of the extolled magic methods is the amulet, the writing on which is supposed to be done with ink of a decidedly sympathetic nature. These amulets, pledges of health, are bits of paper on which the priest writes a verse from the Koran. They are square or triangular in shape, are supposed to be imbued with all the virtues of the Sacred Bird and must be eaten in case of fever; burned and the ashes swallowed in case women wish to become pregnant; placed in a small metal box and suspended in close proximity to the affected part in inflammation of the lungs; and, when there is no disease to combat, are pledges of a continuance of health. All Arabian women and most men are happy possessors of amulets. The following is a translation of the writing on one of these amulets: "Treatment for those who have weak sight: Eat the heart of a pewit mixed with honey, or better still, char its head, pulverize it and prepare as a collyrium. This will have a salutary effect. * * * For a cough, char a pewit in a pan, flesh, bones and feathers, and mix with honey. Pills made of this and taken once a day will cure, provided God Almighty is propitious." To show that the pewit is not the only bird held in high esteem, the clever writer of the lines adds "the owl has the same remarkable qualities and, prepared in the same manner, will not fail to cure the many diseases which afflict mankind."

ORIGINAL ARTICLES.

THE ROENTGEN RAY IN THE DIAGNOSIS OF RENAL AND URETERAL CALCULI.

By R. D. Carman, M. D., of St. Louis, Mo.

Year by year, the inadequacy of diagnosis based upon clinical symptoms alone, that is to say, the subjective symptoms of the patient and the signs elicited by ordinary means, becomes more and more apparent. Too much praise cannot be accorded those clinicians who, by combining careful observation, judicial ability, common sense and occasionally rare intuition, have made diagnostics a real science. The things which they have learned and taught will never become entirely obsolete; they will be modified, developed, elaborated and improved, but, constantly the demand both of faculty and laity, grows more insistent for increasing exactness. Probabilities become less tolerable, errors less excusable. The facts must be had, even though obtainable only by the most extraordinary methods, and every possible accessory is expected to be used. These remarks are especially pertinent to kidney stone, the diagnosis of which, in the past, has rested chiefly upon the following clinical symptomatology: 1. Attacks of renal colic characterized by intense pain, either in the back, or, more typically, in the flank of the affected side, radiating into the testicle and inner thigh. 2. Hematuria and other alteration in the urine, such as the presence of sediment and stones. 3. The signs and symptoms of complications, such as pyelitis; that is to say, chill, fever and pyuria.

Now, while these symptoms are present in many cases of kidney stone, it is inexact to speak of them, as does one textbook, as being "definite and characteristic," for it is also true of many cases that stone may be present without these symptoms; that these symptoms may be present without stone, and that the symptoms may be referred to the opposite side. Some of these facts have been admirably set forth by Charles Lester Leonard and others. In further corroboration I wish to call your attention to some of my cases hereinafter reported.

Boggs and many others, hold that the radiographer should also be a clinical diagnostician, and the writer cheerfully endorses this view. With his uncommon opportunities, the radiographer cannot fail to be interested in the symptomatology of these cases, and in everything of every sort that will aid in their diagnosis. The clinical examination of each patient should be comprehensive and thorough. But—and here I wish to speak with emphasis—the radiographer should not be unduly prejudiced by the information thus gained. The radiograph should stand upon its own bottom. It should be distinctly positive, or distinctly negative. A careful clinical examination plus a careless x ray examination

becomes a doubtful quantity, and no amount of the former will make up for the latter.

Value of the Method. The value of the Roentgen rays in the diagnosis of renal calculi has been so clearly demonstrated that little is left to be said in this regard. Joseph F. Smith quotes Henry Morris as reporting 44 nephrectomies for stone, diagnosticated by clinical methods alone, where no stone was found. On the other hand, Kümmel and Rumpel report a series of 18 cases diagnosticated by the x ray, in all of which the stones were found and removed. A host of similar comparisons can be gleaned from the literature. Indeed, hostile criticism of late rather takes the form that a positive finding is valuable as confirmation, but that a negative finding is of doubtful significance. With a varying, and, as yet, incompletely developed technique, this view may have some justification, but with a further elaboration of methods it will undoubtedly be true, as Cole, Kümmel, Rumpel, and many others, already assert, that with a negative x ray finding, there is no stone present.

W. W. Keen remarks that it replaces an uncertain guess by a positive diagnosis, and its negative value is quite as great as its positive.

J. B. Herrick, editor of "Nothnagel's Practice" (diseases of the kidney), commenting upon Senator's rather mild advocacy of the x ray method says: "The value of the x ray in locating stones has passed beyond the experimental stage. The Roentgen rays will nearly always show a shadow when stone is present, and a failure with a stone present is likely to be due to an error in technique."

Bevan[1] holds that "a perfect skiagraph, with the proper amount of detail and differentiation is of greater value as a means of diagnosis than an exploratory operation. I am done with incomplete operations and operations done in the dark for kidney stones. A good skiagraph will show whether there is one or more stones. It will show which side the stone is on and exploration of the ureter can be omitted in an aseptic case when, from a clear x ray picture, we feel confident all stones have been removed."

Carl Beck[2] says that, contrary to the abundant proof of reliability of renal skiagraphy, text books hesitate to recommend, and even warn the practitioner against this method, because others have observed grave errors committed in its employment.

Whenever error has been committed, it was due to the individual and not to the method, and the latter should not be held responsible.

A definite diagnosis in suspected lithiasis can be made, *i. e.,* a renal calculus must invariably show, provided the calculus is there.

Fenwick[3] states that one of the most distressing of failures in urinary surgery is to cut into a kidney and mutilate it, perhaps irreparably, in order to find a stone which has long ago left that organ and traveled down the ureter; and yet this must happen at least in 22 per cent of all cases of renal stones if the x ray expert is not called upon to help in the diagnosis. "That the expert radiographer can guide the

urinary surgeon with a precision unattainable by any other means is without cavil, and I assert this on an experience of 500 operations upon the kidneys. In fact, I know of no obligation so great as that which the expert radiographer places the surgeon and patient under when he accurately defines a stone in the lower ureter."

Crawford[4] thinks that we are not justified in proceeding blindly in search of a stone, the location of which may be positively demonstrated by the use of this agency.

Holland[5] declares that with a competent x ray examination the operation becomes no longer, so as to speak, an exploratory one. The sufferer is encouraged to submit to operation much sooner, dangerous delay is thus avoided and the surgeon knows exactly what he is going to search for, the exact spot to incise, and, in many cases, exactly how many stones there are. He further remarks that if the x ray shows a small stone engaged in the ureter, with no symptoms of obstruction present, this knowledge would be of great value to the physician as evidence of the possibility of the passage of the stone, and repeated examinations might show the stone gradually passing from the ureter, or its presence in the bladder.

Leonard[6] remarks that the Roentgen method determines with absolute accuracy the presence or absence of all calculi in every case in which a satisfactory negative can be secured, if the negative is correctly read. "The Roentgen method of detecting or excluding calculi from the kidneys and ureters has proved itself to be absolutely accurate, when applied with the requisite technique. The errors which have been noted were all due to defective technique, or inexperience, in reading the negatives. The absolute negative, as well as the positive diagnosis of calculous disease is feasible. It depends solely upon the production of negatives having detailed shadows of tissues less opaque than the least opaque calculus; when such a negative is obtained and correctly read, no error can be made."

Kümmel[7] says: "Our experience has proved that every stone in the kidney becomes visible on a good x ray plate, if the proper technical precautions are observed, and that, on the other hand, if the plate fails to show a shadow, a stone is not present." And he speaks from an experience of 328 cases!

Some Statistics. Owing to the varying manner in which the case figures are furnished, I have found it impossible to tabulate them. However, the following are the more important statistical statements.

C. T. Holland[8] has examined 79 cases and in 22 stone or stones have been found. In 10 cases other shadows occurred, some easily differentiated from stone, others not.

A. B. Johnson[9] has examined 125 cases. In one of his earlier cases, a shadow upon the plate, due to a defect in the gelatin, was diagnosed as a stone. The patient was operated on and no calculus was

found. In 30 cases the positive diagnosis of stone was confirmed by operation. One negative error was due to the use of too short a plate.

F. H. Jacob[10] reports 9 cases. In 6 cases the stones were located and removed by operation. One negative case was lost sight of. In one case in which he failed to demonstrate a stone, but in which the severity of symptoms warranted an operation, a villous tumor of the pelvis of the kidney was found. In the other case, examination showed three small shadows in the left loin. Patient was operated on and three small calcareous glands were found in the mesentery. There was no kidney on the left side.

Max Reichmann[11] reports 64 cases; 23 gave positive results, confirmed by operation. In one case a diagnosis of pyonephritis in one kidney and nephrolithiasis in the other, was made. Operation confirmed the pyonephritis on the one side, but on the other only infected foci were discovered, without the presence of any concretion. Thirty-three cases were absolutely negative, so far as the Roentgen plates were concerned.

L. G. Cole[12] states that in 179 cases he has failed once to show a renal calculus when it was present. The failure was due to the plate not extending high enough to cover the kidney region. In two cases he made a diagnosis of stone when none was present.

Kümmel and Rumpel[13] report 18 cases diagnosed by the x ray, all of which were subsequently removed by operation.

Reid[14] examined 150 cases. Of these 63 were subsequently operated upon. A positive skiagraphic result was given in 36 cases, 25 in the kidney, 3 in the ureter and 8 in the bladder. Of the 25 renal cases, the stone was found by the surgeon in 23 cases and in one it was found post mortem. In one case it was missed, being merely a small collection of sandy material. Of the 3 ureteral cases, 2 were removed and the third passed subsequently. In the 8 vesical cases the stone was found and removed in 7 instances. A negative skiagraphic result was followed by operation in 12 renal cases and 15 vesical, and of these, a stone was found once in the kidney and once in the bladder.

Joseph F. Smith[15] states that in 27 cases of suspected kidney stone operated upon by Bevan, it was possible to make a positive diagnosis of calculus in 13 cases, a doubtful diagnosis in one case and a negative diagnosis in thirteen cases. In the doubtful case, operation revealed a single stone the size and shape of a pumpkin seed, lying well up under the last rib. More careful examination of the skiagraph in this case showed a rather vague shadow directly over the last rib. Dr. Smith states that the failure here was due more to an error of interpretation of the skiagraph than to the skiagraph itself. In the thirteen cases in which a negative diagnosis was made, the following conditions were found at operation: Tuberculosis, 5 cases; pyonephrosis, 2 cases; essential renal hemorrhage, 2 cases; cysto nephrosis, 1 case; hydronephrosis, 1 case; polycystic kidney, 1 case; hypernephroma, 1 case.

Leonard[16] reports 59 cases of suspected renal calculus examined with

the x ray. Of these 59 cases 12 had stones, either in the kidney or ureter; 8 of the cases were confirmed by the operation. One case later passed a ureteral calculus, two others had ureteral stone, but the age of the patient did not warrant operation, and one case of positive diagnosis refused operation.

Of the negative cases, seven were operated upon and the negative diagnosis confirmed in all except one, where faulty technique was responsible for not finding the stone, as the portion of the kidney containing the stone was not in the plate.

Kümmel[7] reports 328 cases, with 65 positive cases confirmed by operation, and makes no mention of any errors.

To the foregoing may be added the writer's 55 cases, reported herewith. In these there was technically one positive error, the stone being in the appendix and not in the ureter. No negative errors have thus far been demonstrated.

The above figures represent a total of 1093 cases with only 12 errors, an error percentage of about 1 per cent. This percentage is quite small, and covers a period of imperfect technique and inexperience. It can be justly claimed that the x ray diagnosis of renal stone is quite as reliable as the Widal reaction in typhoid, or the bacteriologic findings in diphtheria.

Advantages of the Method. 1. The examination is painless. No general or local anesthetic is required, with the resultant depression and subsequent treatment.

2. It requires very little time, and the dangers of burn are practically nil.

3. It gives the exact location of the stone or stones, whether in the kidney or ureter, and, most important of all, gives the number of stones present.

4. There is no exploratory operation necessary, as far as the detection of calculi are concerned.

5. Calculi bilaterally situated are recognized, and the danger of operating upon the wrong kidney or ureter thus obviated.

6. The negative diagnosis is as accurate as the positive, when proper care is taken.

Technique. The patient for x ray examination of the urinary tract, should be given a cathartic several hours before the examination. This is done to eliminate fecal concretions and to minimize the number of exposures.

At the time of exposure, all clothing is removed from the part to be examined and the patient may then be covered with a thin sheet if necessary.

The patient lies upon his back, with the shoulders elevated and the knees flexed, thus to bring the kidneys as close to the plate as possible. This is most conveniently done by the aid of pillows and sandbags.

Some form of compression is always used to limit the motion of the

Fig. I. No. 1. Calculi passed by Dr. G. No. 2. Calculus removed from kidney. No. 3. Calculus removed from left ureter. No. 4. Calculus removed from kidney. No. 5. Calculus removed from bladder. No. 6. Small uric acid calculi removed from ureter by the aid of the cystoscope. All these calculi were shown in skiagrams, except No. 6.

kidney, due to respiration. This is accomplished either by the abdominal binder, the compression diaphragm, or by instructing the patient to hold the breath. In the first examination two 11x14 plates are used. These plates carefully placed will give us pictures of the whole urinary tract. Following this examination, smaller plates are used with the compression diaphragm to more carefully examine smaller areas successively.

In this connection, I should like to say that the most valuable kidney plates are not usually beautiful as works of art, nor easily read by the inexperienced. They are not "photographs" of the kidney at all. They are records of relative density.

As more than half of the Roentgen technique depends upon the Crookes tube, it might be well to mention that the writer prefers a heavy self-regulating tube, neither too low nor too high in vacuum. The one I like best might be called by some a "seasoned tube." With such a tube, a good coil and a mercury turbine interrupter, we are able to get good tissue differentiation, and the exposure may vary from one to five minutes without change of vacuum, or danger to the patient.

The development is best done by the operator. Plates in which calculi are suspected should be developed with a rather dilute developer in order to increase the contrast between soft structures. This will necessarily prolong the time of development, but the results obtained are so satisfactory that the time is well spent.

The interpretation of the negative requires careful study and experience. I prefer to study the negatives in an illuminated box, looking at them from a distance with opera glasses, as suggested by Kümmel. Robert Abbe[17] remarks that to appreciate the meaning of skiagraphs requires as much experience as the technique of taking them. The most useful plates are often those which at first sight seem failures. A wet plate may show nothing, but when dry and held in proper light, may give good results.

In radiographic examination for stone errors are of two kinds:

Positive Errors. By a positive error we mean radiographic diagnosis of the stone when none is present. They are as follows:

1. *Phleboliths.* These are usually bilaterally situated; the shadows cast are usually more definite, sharply defined and are smaller than ureteral calculi. In a measure they can be excluded by a picture taken with the aid of the ureteral bougie, as suggested by Fenwick, of London.

2. *Foreign Bodies in the Appendix.* Dodd and Osgood[18] mention this possibility, and case 8, hereinafter reported, is an example. This error, however, can be eliminated by skiagraphing with the ureteral bougie *in situ.*

3. *Cheesy Deposits in the Calyces of the Kidney.* Also mentioned by Dodd and Osgood.[18] Presumably these would only be caused by tuberculosis, and a bacteriologic examination of the urine might be of service.

4. *Scybalae or Fecal Concretions.* These can usually be eliminated

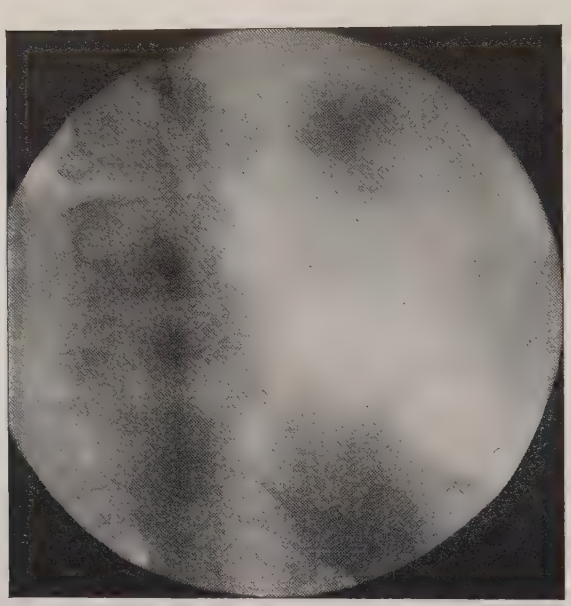

Fig. 2. Calculus in right kidney.

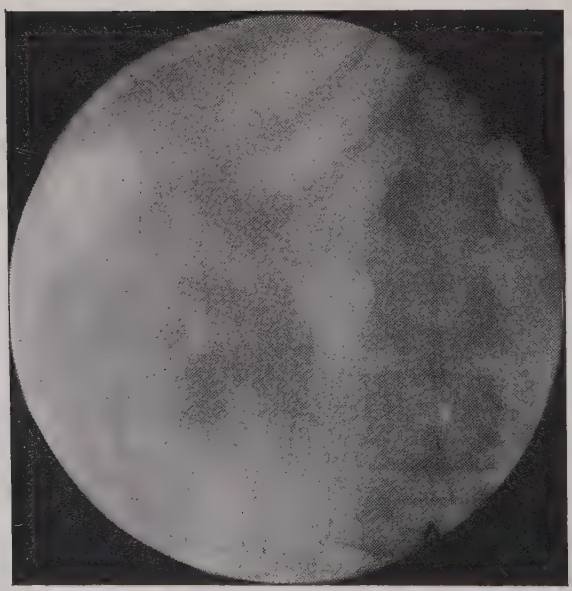

Fig. 3. Calculus in left kidney. Both Fig. 2 and Fig. 3 from the same patient.

by screen examination when they are displaced laterally by the peristaltic movements of the bowel, and by catharsis and a second examination.

5. *Small Bony Deposits in the Pelvic Ligaments.* Here again the bougie is of value.

6. *Calcified Lymph Glands Around the Lower Portion of the Ureter.* These also can be excluded by the ureteral bougie.

7. *Transverse Processes of the Vertebræ (Especially When the Outer End is Chalky) and Ossification in the Rib Cartilages as Mentioned by Albers-Schoenberg.* These can usually be eliminated by close inspection of the plate.

8. *Dense Masses of Fibrous Tissue as Mentioned by Riddle*[19] *Who Cites a Case in Which an Operation had been Done Leaving a Thick Scar, Which Cast a Shadow Similar to Stone.* The history of any previous operation along the area to be examined should be taken into account. Practically this source of error is unimportant.

9. *Defects in Plates.*

10. *Atheromatous Conditions.*

11. *Drugs in the Intestine—Bismuth*—(Baetjer).

Negative Errors. By a negative error we mean a failure to make a radiographic diagnosis when stone is present. Among the causes are:

1. *Obesity.* Obesity increases the difficulty of getting shadows, but, unless extreme, it is not insuperable. The compression diaphragm is of great value in these cases. Case No. 9 of this series weighed 200 pounds.

2. *Uric Acid Stones.* This is practically nil as pure uric acid stones are rare. Urinary calculi usually contain enough of the opaque salts to cast shadows.

3. *Defects in Plates.* Excluded by close examination of the plate and a second examination.

4. *Imperfect Technique.*

To sum up the sources of error, one can readily see that they are mainly in the individual and not in the method.

To date I have examined by the Roentgen method fifty-five cases of suspected renal stone. Shadows indicative of stone were found in twenty-five. Of these, ten have been operated upon and the stones removed. An eleventh case was also operated upon and the concretion discovered to be in the appendix.

Of the twenty-five cases in which the Roentgenograms showed stones, the shadows were in the kidney alone in seven; the shadows were in the ureter alone in fifteen, and in the kidney and ureter in two.

In none of the cases were both kidneys involved. Shadows were found in both ureters in four cases. In one case there was a stone in the right kidney and one in the right ureter. In another case there was a stone in the left kidney and one in the right ureter.

In ten cases the stone shadows were multiple.

In one case, confirmed by operation, the symptoms were referred

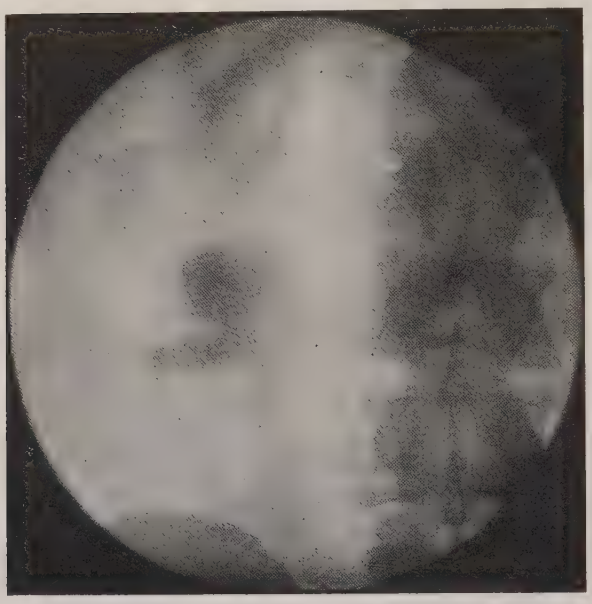

Fig. 4. Large calculus in left kidney.

Fig. 5. Large calculus in bladder.

to the side opposite to the one affected. Another similar case has not yet been operated upon.

Of the fifty-five cases examined no stones were found in thirty. Four of these were operated upon and other conditions than stone discovered, so that in the thirty negative cases no error has yet been demonstrated. Some of the interesting ones are as follows:

Case 1. Mr. H., age 43, attorney. Referred by Dr. Bransford Lewis. Complained of pain in left lumbar region. Six years ago there was a passage of sandy particles in urine. January, 1905, first of a series of similar attacks, which usually began as a dull aching in left abdominal region. After an hour of such aching the pain became sharp, extending down the left side into the bladder and left testis. Patient has had four such attacks. Urine showed some red blood cells. In October, 1905, under chloroform anesthesia, ureteral catheterization was attempted. Obstruction was met on both sides about one inch up the ureter.

Skiagrams showed two shadows in left ureter region and one in the right. The shadow on the right side was not in the ureter, as shown by ureteral catheterization, while on the left side the catheter coiled up in the bladder after meeting obstruction with the stones.

Case 2. Mr. B., age 25, salesman. Referred by Dr. Hugo Summa. Patient has been operated upon for appendicitis, post-operative hernia following. Present illness began last March, with pain in left lumbar region, extending into the groin and accompanied with chills, fever and vomiting. Duration nearly three weeks. Second attack in November with pain in left side radiating into glans penis. No chills or fever with this attack. Vomited once. Urine negative.

Skiagrams: Shadow in left uterer region, intrapelvic. Fourteen days after skiagraphy, and five days after medical treatment by Dr. Summa, patient passed a stone.

Case 3. Mrs. X., referred by Dr. Jesse S. Myer. First seen three years ago when patient complained of a dull, aching pain in the left side. The patient later consulted a Chicago physician who catheterized the ureters and said the kidneys were normal. Recently patient had an acute attack of la grippe. During this time patient complained of acute pain in left side. Urine: Red blood cells and a few leucocytes.

Skiagrams showed three shadows in left kidney region.

Operation, March 28, 1907. Three stones were removed from the left kidney pelvis, one fully as large as a pigeon's egg, very irregular in outline, showing here and there the mulberry type. Two smaller stones, about the size of peas, more regular in shape and of the mulberry type. Patient convalescent.

Case 4. Mr. F., age 54, merchant. Referred by Dr. G. M. Phillips. This patient had had four attacks of abdominal colic in the last three years. The pain was quite severe, extending into the left groin. Pa-

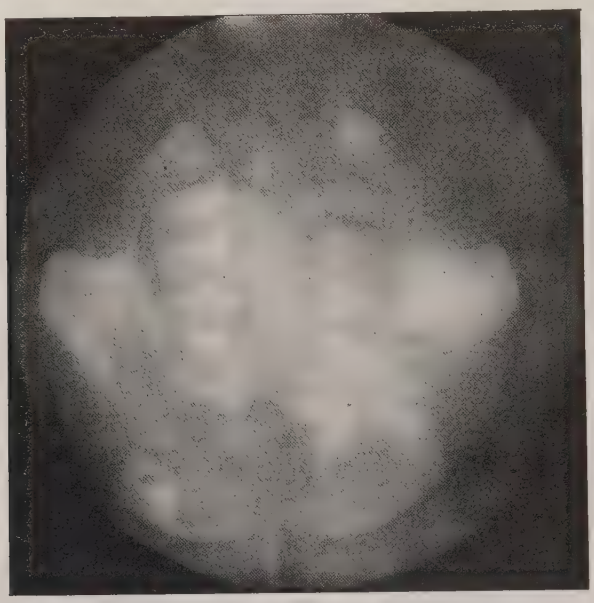

Fig. 6. Calculus in left ureter, about one inch from bladder.

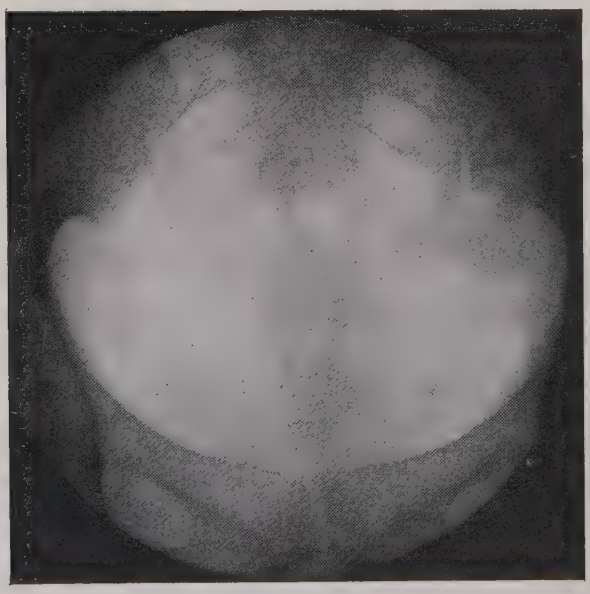

Fig. 7. Calculus in right ureter.

tient had chilly sensations, fever and some nausea, with each attack. Urine: acid, some red blood cells. No pus or albumin.

Skiagrams showed a shadow in left ureter region, intrapelvic.

Operation: Ureter was exposed retroperitoneally and on palpation a small mass was felt in the ureter within the pelvic cavity. The ureter was then followed as high as possible and nothing felt. Returning to where mass was found, nothing could be felt as before and ureter seemed clear. Dr. Phillips then washed the crumbled up stone from the bladder. This patient made a good recovery and has had no symptoms since.

Case 5. Mr. M., age 67, merchant. Referred by Dr. Jesse S. Myer, November 1, 1906. For about a year had had stomach trouble. In July began to notice pain which he located in the right lumbar and iliac region. The pain was deep, dull, aching in character and usually disappeared when the patient assumed a reclining posture. Urine: Acid, slight amount of albumin, very few red blood cells, numerous leucocytes, few casts.

Skiagrams showed a shadow in right kidney region and one in right ureter region, intrapelvic.

Operation February 15th, 1907. Kidney delivered, palpation of pelvis showed no stone. Incision through cortex revealed a mulberry stone, larger than a pea, which was removed. The ureter was then exposed retroperitoneally and a smooth stone about one half the size of a pea removed.

Case 6. Mr. F., age 45. Referred by Dr. Willard Bartlett. Abdominal trouble for five years. In June, 1902, appendix was removed with no relief of trouble. Patient still continued to have a dull, aching pain in the right abdomen, which was constant unless the patient was perfectly quiet. Some digestive trouble with occasional vomiting. Months of strict diet had not helped him, nor had rest and change of climate.

In April, 1906, skiagrams of the urinary tract gave a shadow in left ureter region, intrapelvic.

Operation April 25, 1906. A smooth round stone, about the size of a buckshot removed from the left ureter. May 8th, patient went home perfectly well and has had no symptoms since.

Case 7. Mr. H., aged 44, druggist. Referred by Dr. Willard Bartlett. Patient has had indefinite pain in abdomen for about three years. Fourteen months ago commenced to have attacks of abdominal colic in left side. These were exceedingly severe and were usually followed by blood in the urine.

Skiagrams showed a shadow in the left kidney and one in right ureter intrapelvic. Urine: Red blood cells and pus.

Operation October 27. Confirmed all shadows. November 10th, patient sitting up and ready to leave the hospital.

Case 8. Miss I., age 31, referred by Dr. M. G. Seelig, February 28, 1907. Present trouble began four months ago with pain in back and

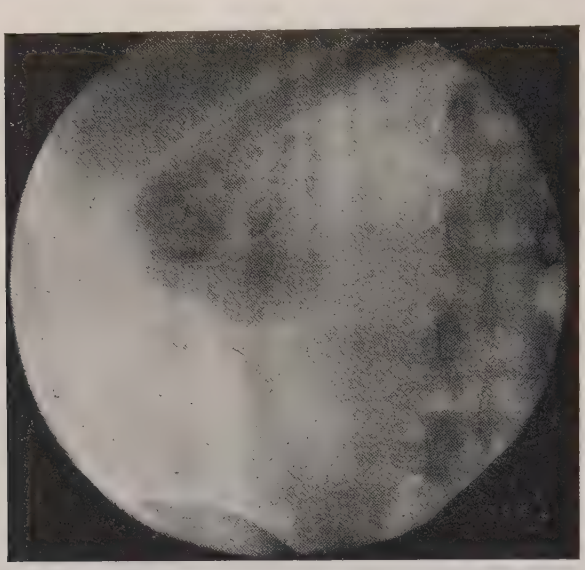

Fig. 8. Tuberculosis of left kidney, showing multiple phosphatic stones.

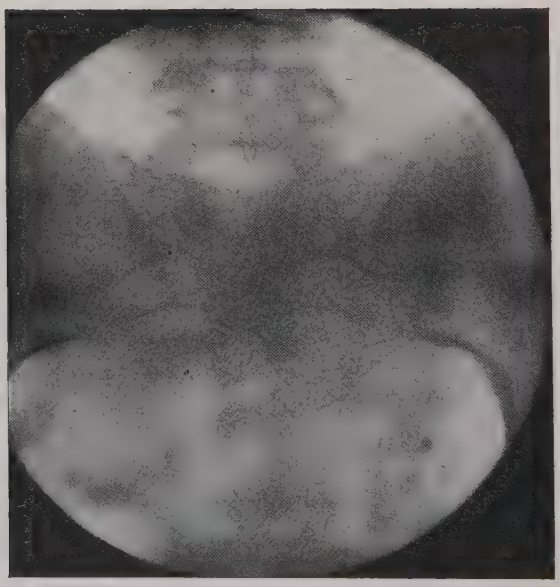

Fig. 9. Coprolith in the appendix simulating calculus in the ureter.

right lower abdominal quadrant. Patient noticed blood in the urine twice. A week ago had an acute attack resembling stone colic, patient fainting from pain. Cystoscopy showed normal ureteral orifices. Ureteral catheter entered left ureter and easily passed to kidney. In the right ureter progress of catheter was blocked about three inches from ureteral orifice. Urine: Negative.

Skiagrams showed a shadow in right ureter region intrapelvic. This observation was confirmed three times, the shadow, however, being two inches lower in the first plate than in all the others.

Operation: Extraperitoneal exposure of the ureter failed to locate ureteral stone. Small stone felt intraperitoneally which proved to be a coprolith in the appendix. The base of the appendix was adherent to the ureter. The coprolith consisted of a small organic seed as a nucleus with a mass of feces around it.

Skiagrams of this coprolith after removal gave a distinct shadow. Examination of patient after recovery showed an absence of the shadow.

Case 9. Mrs. B., age 41. Referred by Hugo Summa. Patient stout, weighing over 200. Abdomen thick and pendulous. For six months had had frequent attacks of pain in left side high up, radiating into gastric region, which led to a diagnosis of and treatment for stomach trouble by one of her physicians. Urine contained uric acid crystals; traces of albumin, discoverable only by Spiegler's test.

Skiagrams: After eight examinations a shadow was found in left ureter region, intrapelvic.

November 17, 1906, operation. Ureter was exposed retroperitoneally and a stone the size of a small bird-shot removed. December 5th patient went home to California and has had no symptoms since.

Case 10. Mr. R. Referred by Dr. Bransford Lewis. Trouble began five years ago with pain in left lumbar region, which was less severe in cold weather. This patient consulted six physicians and two osteopaths with no diagnosis or relief. Urine: Blood cells, calcium oxalate crystals. Cystoscopy and ureteral catheterization negative.

Skiagrams showed shadow in left kidney region.

Operation September 21, 1905. The stone was in renal pelvis, was about the size of a large pea, and had the color and appearance of a mulberry. Recovery uneventful and complete.

Case 11. Mr. H. P., age 43, salesman. January 20, 1907. Patient has complained of back for years. Two years ago had abdominal colic which lasted for about eighteen hours. Pain severe, requiring morphine. Chilly sensations and fever. No vomiting. In October, 1906, a second attack of abdominal colic, vomiting, no chills or fever; recovery in two weeks. Since this attack patient has been comparatively free from pain. Urine: Blood and calcium oxalate crystals.

Skiagrams of urinary tract show a shadow in left ureter region intrapelvic.

Dr. Lewis, with cystoscope in bladder, tried to pass a metal probe

up ureter to stone. The probe encountered a stricture at the ureteral opening so that efforts to pass it carried a loop of ureter up and to the inner side of stone.

Case 12. Mr. L. Referred by Dr. A. N. Curtis. Present trouble commenced eighteen months ago with sudden and severe pain in right lumbar region, extending into the groin and testicle. No chills, fever or vomiting. Six months later a second attack, less severe, lasting only a few hours. A month later was refused life insurance because of albumin in the urine. One month ago a third attack similar to the first. Urine: Albumin, red blood cells, pus and casts.

Skiagrams show a shadow in right kidney about the size of a hazel nut.

Operation: A single stone of the size indicated, rather rough, of the mulberry type, was removed from the kidney pelvis.

Conclusions. 1. The accurate diagnosis of kidney or ureteral stone is possible by the Roentgen ray only.

2. Clinical symptoms alone are insufficient to determine the presence or absence of kidney stone, their number, size or location.

3. Every suspected case of stone should be radiographed.

4. The radiographic examination should yield a definite result.

5. The interpretation of the plate is as important as the making of it.

6. The causes assigned for radiographic errors are, for the most part, not insuperable. There are few that cannot be overcome by improvement in technique, by perseverance and by experience.

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A ROENTGENOLOGICAL DISCUSSION OF BONE LESIONS.

By Edward Holman Skinner, M. D., of Kansas City, Missouri.

It is not only my aim to discuss the roentgenological findings in the diagnosis of bone lesions but also to impress upon the general practitioner and surgeon the wonderful help that the roentgen ray will render in this diagnostic field.

In presenting a study of bone lesions, it becomes necessary to correct some of the earlier impressions of the profession in regard to the ability of the roentgen ray to record tissues on the emulsion plate. Where formerly the surgeon employed the roentgen ray operator only for fracture work and received the word of the x ray man that the bone was fractured at such and such a place and the displacement graphically drawn on paper but the plate never shown as it was "inadvertently dropped in the dark-room, film side down;" that was about all the satisfaction that the surgeon received and even if the plate was exhibited it was nothing more than a shadow picture of the parts. But at this time such work will not satisfy the surgeon or the Roentgen consultant.

We must understand that the ray penetrates all substances in varying degrees. That the roentgen plate is a record of density and not a shadowgraph. When the earlier tubes were used the negative did simulate more closely the silhouette or shadowgraph but now the use of more perfectly adjusted tubes and apparatus has given us what we really desire—a record of the density and therefore the detail of the tissues interposed between the tube and the emulsion on the sensitized plate.

We all realize that the methods of diagnosis are valuable in direct proportion to the technic and experience of the diagnostician. The roentgen plate must be interpreted after exposure to be of value. Unless the surgeon has acquired special knowledge of the interpretation of densities, he cannot correctly translate the roentgenogram and is sometimes incapable of appreciating the refinement of the diagnosis that the roentgenologist can give, providing that to his ability as a practical x-ray operator he adds the knowledge of clinical pathology and diagnosis. The satisfactory results of radiographic diagnosis depend therefore on expertness in technic and experience in clinical interpretation of the roentgenographic detail. The physician applying to the roentgen consultant should understand and also let the patient know that he is not applying to the roentgenologist for a picture of the lesion but is applying to the roentgenologist for his diagnostic conclusions after the necessary negatives have been made. I desire to quote from Willey of Michigan University: "Though he be an enthusiast, the roentgenologist should scrupulously avoid making hasty examinations and conclusions, extravagant claims or of making a positive diagnosis from his plates except when absolutely justified in doing so. It is better to err on the side of conservatism than to shake the faith of his colleagues by pre-

mature conclusions. There should be a united effort on the part of the roentgenologists to give to the medical profession an accurate knowledge of the use of the roentgen rays and to keep the work within the bounderies of its legitimate field."

Fig. 1 shows necrotic area in humerus.

The technic of roentgenology has developed and is developing to a high degree of efficiency in its application to all departments of medicine and surgery. The roentgenographer must not merely be a photographer but possessed of sufficient diagnostic acumen to become the consultant of the physician and surgeon. And it is only when plates are made and interpreted by such roentgenologists that the hesitating surgeon will

be prone to send cases for a roentgen diagnosis with confidence in the ability of the roentgenologist to render value received. The clinical history of the case must be considered by the roentgenologist to the same extent that the microscopist considers clinical symptoms in a blood diagnosis. The practical and scientific and legal value of the roentgenogram cannot be overlooked by the surgeon.

In line with the subject of my paper, I desire to first call your attention to the roentgenological diagnosis of syphilitis bone lesions and the pathological diagnosis of the same in a few negatives. The bone tis-

Fig. 2 shows a proliferating periostitis; non-specific.

sues are more frequently involved in the tertiary stage—the stage which has developed after the patient has often forgotten the initial symptoms and comes to the physician with a faulty history that makes the absolute diagnosis impossible without the aid of objective methods of diagnosis. The roentgen ray here becomes a practical aid to the physician. We frequently find gumma of the bone periosteal or subperiosteal in origin with the swelling of the peripheral tissues and the thickened periosteum covering same being somewhat irregular in outline. As the gummatous process continues we may have the degeneration and resorption of bone tissue, producing a honey-combing of the bone about

the syphilitic sequestra. The detail of such processes may be demonstrated on the roentgen plate readily. The osteoporosis frequently escapes the diagnostician as only the irregular outlines of the bone involvement would be palpable. The earlier pathological steps in syphilitic bone lesions do not present the startling bone decay but the

Fig. 3 shows a typical syphilitic tibia; this shows the gummatous thickening of the anterior portion of the bone and the periosteum.

diagnostic negative will show the thickening of the bone periphery, periosteal thickening and formation of osteophytic spurs on the under surface of the periosteum. The differential diagnosis of syphilitic bone involvement and osteomyelitis is cleared up considerably by taking diagnostic roentgenograms of both sides of body or limbs. Syphilis gives us the bilateral involvement and follows the pathological course as outlined above. The osteomyelitis is usually within the medula of the bone with a rarifying process in the surrounding tissues rather than the cortical thickening and tissue sclerosis of the syphilitic lesion.

Osteosarcoma would only be confounded where the syphilitic condition was confluent and of great porosity. Osteosarcoma gives us such rapid bone overgrowth with unilateral involvement only.

In taking roentgenograms of bone disease it is well to make exposures of the corresponding portions of the body for comparison. The parts should be taken with identical technic as regards tube vacuum and distance and position of part on plate to avoid errors of distortion and ray penetration. If the two parts can be placed on the same plate, it is better. This is easily accomplished in extremity work.

Fig. 4 shows the absorption of the bone salts in the carpal and metacarpal bones, following an interference with the circulation from a faulty healing of a Colle's fracture. The trophic disturbance of the hand affects the flesh of the hand also.

Tubercular bone lesions show up as light spots in the negative on account of the softening of the bone tissues. The process being one of bone degeneration, the extension of the process could be determined by successive exposures. The gradual absorption of the bone salts and the increase of the size and outline of the bone will display itself on the negative. The tendency of the tubercular process to burrow into the soft parts will afford us the opportunity of showing the outlines of such extensions. As an example of the latter we might cite the diagnosis of the psoas abscess as a complication of Pott's disease. The cheesy mass of the tubercular process shows up denser than the surrounding tissues. There is also a rarified condition of the bone surrounding the diseased process. I shall only mention at this time the value of the roentgen ray

in the diagnosis of tubercular conditions of the hip and other joints. And it is not necessary to wait for the extensive involvement of the joint in order to record it on the plate. The hip-joint is not the *bete-noir* of the roentgenologist as it was before the introduction of the compression cone diaphragm and the tube with high penetration.

Periosteal lesions will usually show a bulging of the outline of the periosteum in the acute inflammatory conditions and if there is developed an ossifying process on the inner surface of the periosteum this

Fig. 5. Non-union of tibia. Necrotic area with sequestrum internal to shaft.

condition will display itself on the plate with the irregular bone overgrowth and consequent abnormal ridging of the periosteum.

The osteomyelitis lesion will show as an abnormal density in the bone tissues from the increased blood to the parts, and with the subsequent breaking down of the bone we have the negative displaying the lack of bone structure and the formation of the sequestrum. The accompanying inflammation of the periosteum and tissues about the bone and the formation of nature's wall about the sequestrum will show up on the roentgen plate and be of unmistakable value in the totality of the symptoms that make the correct diagnosis.

The location of the necrotic areas and sequestra by the roentgen method is of the greatest assistance to the surgeon before operating as the ray will determine the number of sequestra with their relation to the surrounding parts.

The more rarer lesions of the osseous system such as osteomalacia, acromegaly, leprosy and cretinism are able to be displayed on the roentgen plate according to their various pathological findings. The osteomalacia will show an increased transparency on the roentgen plate with the thickening and distortion of this condition that ensues from the increased vascularity and absorption of bone salts. Acromegaly will dis-

Fig. 6. Absorption of bone salts from trophic disturbance, following a crushing injury of instep.

play the hypertrophic bone overgrowth in the epiphyses of the long bones with the same process in the bones of the skull and lower jaw. The clinical history of this class of cases will be necessary to make the roentgen ray valuable. Usually the clinical diagnosis of these conditions in the advanced stages is so apparent that it is only in the obscure early stages that the roentgen consultant will be sought.

Sarcoma of the bone tissues when of dimensions that present deformities are easily displayed on the roentgen negative. The value of the negative becomes enhanced by the ability of the plate to determine whether it be of periosteal or medullary origin. The early medullary

type shows up as a light spot in the negative which increases in size on observation but does not become multiple as in an osteomyelitic or syphilitic lesion. The periosteal type will gradually encircle the bone and present the pathological growth on the negative.

The application of the ray in the diagnosis of deformities is of apparent value. The exact adaptation of the spinal column deformities to the flat

Fig. 7. Same case as Fig. 6, showing obliteration of joint-spaces from an inflammatory arthritis, traumatic in origin.

glass negative is of difficulty and therefore the bone detail is faulty although the bone outlines may be displayed. I believe that the use of sensitized film made up in a large sheet would be of great value on account of its ability to conform to the deformity of the parts. Such film has been used in elbow work. I have never seen any mention of its use in deformities of the spine but believe that it is practical.

621 Commerce Bldg.

THE X-RAY TREATMENT OF LEUCEMIA.*

By Albert E. Taussig, M. D., of St. Louis, Mo.

I desire to submit a very brief summary of three cases of myelogenous leucemia, treated by means of the x rays.

Case I. C. O., white, male, aged 41, came to the Washington University Hospital Medical Clinic May 17, 1906. The case was studied and most of the blood counts made by Dr. W. H. Rush. His family and previous history were without significance. For about two years he had observed a mass in the left half of the abdomen slowly increasing in size and during this time he had lost in weight and strength. More or less pronounced dyspeptic symptoms had set in, together with dyspnoea, cardiac palpitation, a harrassing cough, night sweats, cramping pain in arms and legs and impaired vision. For some months he had been quite unable to work. When the patient presented himself, he was pale, emaciated and evidently very weak. He had no fever and weighed 134 pounds. The physical examination, in a word, showed the signs of a high diaphragm, a soft systolic murmur at the apex of the heart and an enormous spleen extending from the eighth rib in the left axillary line to the crest of the ilium, filling the entire left half of the abdomen and extending over 5 centimeters to the right of the umbilicus. The blood count showed 50 per cent. hemoglobin, 2,048,000 red cells and 507,500 white cells distributed as follows:

Polymorphonuclear neutrophils	47.2	per cent.
Polymorphonuclear eosinophils	1.7	" "
Lymphocytes	3.5	" "
Large mononuclears	0.3	" "
Mast cells	9.2	" "
Myelocytes	38.1	" "

One megaloblast and many normoblasts were found.

The sputum contained no tubercle bacilli, the urine a trace of albumen and a few casts. As the patient had already undergone a thorough course of medicinal treatment, a series of x ray exposures was at once begun and at the same time Fowler's sol. was given by mouth. The splenic area was exposed to a moderately hard tube three to four times weekly for ten treatments. Then, owing to the appearance of a dermatitis, the sittings were interrupted for a few weeks and resumed when the dermatitis had disappeared. The x ray treatment was in charge of Dr. H. P. Wells. The patient's improvement was rapid and steady. Five days after beginning treatment the red blood count had risen to 3,382,000 and the leucocyte count had dropped to 370,000 with 34 per cent. myelocytes. A week later the leucocyte count was 270,000 and on June 8, 154,000. Meanwhile the patient improved subjectively in every way and the bronchitis cleared up. On June 18, when the patient had resumed his work as a driver, the hemoglobin was 55%, the red count 3,750,000 and the white 57,850. On July 6, his weight had increased to 140 pounds, his hemoglobin was 75%, with over 4,000,000 red cells, and 71,900

*Read before the St. Louis Society for Internal Medicine, March 18, 1908.

leucocytes. His spleen had shrunken to one centimeter below the level of the umbilicus. Except for some desquamation and pigmentation, the skin over the spleen showed no ill effects from the treatment. In August he reported himself at work and feeling well. His weight was 144 pounds, hemoglobin 70%, red cells 4,800,000, white cells 12,000 with 2.7 per cent. myelocytes, the normal neutrophils having risen to 79.9 per cent. His spleen extended only to 5 cm. above the level of the umbilicus. He continued to gain in weight and strength, the blood picture showing insignificant fluctuations and his spleen steadily shrinking. Thus in February, 1907, he was feeling and looking perfectly well, weighed 160 pounds; the spleen extended only 2 cm. below the costal margin, while his blood showed 80% hemoglobin, 4,770,000 red cells and 19,800 white cells with 2.2 per cent. myelocytes. In April he weighed 170 pounds, but no blood count was made at that time. Thereafter he continued to feel well subjectively but lost a little ground objectively during the summer. The x ray treatment was discontinued in June and the patient was not again seen until March 27, 1908. He seemed a little weaker but, on the whole, felt well. His spleen extended from the sixth rib about an inch beyond the navel. His blood contained 4,340,000 reds, 75% hemoglobin and 134,000 whites with 36% myelocytes. A relapse is evidently in progress for which he is planning to take another course of x ray treatment.

Case II. C. C., male negro, aged 19, entered the Washington University Hospital March 25, 1907. His family and past history were without special significance, in particular there is no record of any hemophilia among his relatives. He believed himself to have been well until July, 1906, when after the extraction of a molar tooth he bled profusely and nearly constantly for nine days. His prostration was extreme and it was three months before he was able to return to his work as a laborer. Two months later he went through what was apparently a severe attack of acute articular rheumatism, which has recurred at intervals ever since and has incapacitated him from work. Some three weeks before entering the hospital he awoke one morning to find his penis in a state of extreme erection and very painful when handled. Perhaps as a result of manipulation the priapism grew worse and a bloody urethral discharge appeared. Otherwise he continued to feel well in every way. When first seen he appeared rather emaciated, weighing 130 pounds, mucous membranes pale, with an intermittent fever ranging from 97.6° to 101°. His thorax was normal except for the results of a high diaphragm. The abdomen was somewhat distended, the spleen extending from the seventh rib in the anterior axillary line not quite to the level of the umbilicus. The liver was not palpable and only a few bullet-like post-cervical lymph nodes indurated. The penis was in a state of extreme erection, the largest I have ever seen, extending to the umbilicus when laid upon the abdomen. Its length was 16 cm. and its greatest circumference 11.5 cm. It was very tender to manipulation and at intervals a trickle of blood oozed from the meatus. A soft swelling in the

perineum simulated the presence there of a pus collection. The blood count showed 580,000 white cells distributed as follows:

Polymorphonuclear neutrophils	46.8 per cent.
Lymphocytes	1.6 " "
Large mononuclears	0.4 " "
Eosinophils	4.4 " "
Mast cells	6.0 " "
Myelocytes	37.6 " "
Normoblasts	many.

A course of x ray treatment was at once inaugurated and the patient was given calcium carbonate 3i by mouth and every four hours. The urethral bleeding, the priapism and the perioneal swelling promptly disappeared, so that the patient again felt practically well. The blood picture, however, underwent no change. In view of the known resistance of negroes to x ray burns, excessive exposures were tried. The region of the spleen as well as the long bones were exposed daily to a moderately hard tube at a distance of 10 cm. for from 10 to 17 minutes. There were no ill effects of any kind, but the blood picture was not essentially influenced. After five weeks of this treatment the x rays were discontinued and arsenic given in various ways: Fowler's solution and sodium cacodylate by mouth and atoxyl hypodermically and intravenously, all without avail. Finally towards the end of May the patient left for his home in southern Missouri with a leucocyte count of 485,000 and 40 per cent. myelocytes, the spleen as large as ever but feeling well subjectively. He has not been heard from directly since that time, but an acquaintance states that he was apparently in fairly good health until August, 1907. A rapidly progressive dropsy then ended in his death. There had been in the interval neither hemorrhage nor priapism.

Case III. J. W., white male, aged 38, was first seen on September 23, 1905. His family and past history were without significance. For six months he had been losing weight and strength and had been complaining of pain beneath both scapulae. Of late there had been some digestive disturbance, and, for a month, severe night sweats. There had been no cough and no hemoptysis. For about three weeks the sexual appetite had been failing. The patient appeared pale and languid, with a temperature of 99.6, pulse 96 and weight 143 pounds, a loss of 31 pounds in ten months. His physician had told him he had consumption and had ordered him west. The physical examination, in a word, showed a suspicious right apex and a hard spleen extending just beyond the navel. There was no lymphatic tumefaction. A blood spread showed typical myelogenous leucemia and he was told to return for further examination. He was not, however, seen again until April 14, 1906. He had been holding his own subjectively but his spleen had greatly enlarged extending from the sixth rib in the mamillary line to Poupart's ligament and from the right flank to a point 6 cm. beyond the middle line. His blood contained 65 per cent. hemoglobin, 3,850,000 red cells and 350,000 leucocytes distributed as follows:

Polymorphonuclear neutrophils	52.6 per cent.
Myelocytes	40.8 " "

Lymphocytes ..... 2.7 per cent.
Large mononuclears ..... 2.6 " "
Eosinophils ..... 1.3 " "
Mast cells .....none found.
Normoblasts .....many.

The patient went to Eureka Springs, Ark., where Dr. C. F. Ellis gave him a course of x ray exposures. During his two months' residence there he received 53 exposures of ten minutes each over the splenic area. His spleen began to shrink after the fourth exposure and the patient rapidly gained in weight and strength. No medication was used, except once for an intercurrent diarrhœa. When seen again in July, he felt and looked well. His spleen extended barely to the umbilicus and his blood contained 88 per cent. hemoglobin and 14,800 leucocytes, with 12 per cent. myelocytes. He returned to his work as a foreman in a factory and continued to improve under moderate doses of Fowler's solution. In August, 1906, he felt absolutely well, weighed 147 pounds and the spleen was barely palpable under the costal margin. His red blood count was 5,940,000, hemoglobin 80% and leucocytes 9,480 with 1.4 per cent. myelocytes. Thereafter he continued to feel well and his weight increased to 157 pounds, but his leucocyte count and the splenic tumor increased. In December, 1906, with a leucocytosis of 44,600 and a spleen extending to the level of the umbilicus, he was again subjected to a course of x ray treatments, this time, however, without avail. In the course of ten weeks, he received 36 exposures over the spleen and the long bones, by a physician especially skilled in this work. When in March, 1907, the treatment was discontinued, he felt much weaker, though he weighed 156 pounds. His blood contained 142,000 leucocytes with 21 per cent. myelocytes and his spleen extended well below the level of the umbilicus. During the next three months he received Fowler's solution by the mouth or atoxyl hypodermically, but lost ground steadily. Towards the end of June, 1907, he had had to quit work and apparently had not long to live. His spleen again extended below the crest of the ilium, having a length of 32 cm. and a width of 24 cm. His blood contained 247,000 leucocytes with 37 per cent. of myelocytes. As a last resort, the x rays were again applied, but this time in excessive dosage. At first every day and later several times weekly, exposures were made to the region of the spleen, through a rubber sheet, with a hard tube at a distance of never over 10 cm. and a duration of from 15 to 20 minutes. Occasionally when a burn seemed impending, the treatment was discontinued for a week. No medication was given. To our surprise the improvement was prompt and rapid. His weight rose from 130 to 150 pounds; his strength increased correspondingly. The spleen steadily diminished in size until it barely extended below the level of the umbilicus. The white blood count fluctuated somewhat, but after July never rose above 70,000, being 18,200 in August with 10 per cent. myelocytes and 22,000 in October. From time to time, various accidents to the apparatus necessitated an interruption of the treatment. On each occasion the leucocyte count promptly rose but yielded again to a renewal of the treatment. In December, however, the exposures were definitely discontinued, with a leucocyte

count of 47,000. During the following month the patient held his own subjectively and objectively and towards the end of January, feeling strong and well, went to California to raise chickens.

This case presents a number of features of interest. The duration of the case is unusual, the patient being subjectively well and able to work nearly three years after the onset of his leucemia. Moreover, the fact that of the three courses of x ray treatment, to which the patient was subjected, the first and the last should have resulted in rapid and marked improvement, whereas the second was entirely unable to arrest the patient's change for the worse, is not easily explicable. As stated above, the second course of treatment was administered by a physician unusually skilled in x ray work. Perhaps the explanation is to be sought in the fact, that in the third series of exposures I used a very hard tube. Finally, the fact that during this third course of treatment, an x ray dosage, usually considered as never permissible, not only proved innocuous but definitely life saving, should be noted.

When Senn in 1903 reported the first case of leucemia apparently cured by means of the x ray, his announcement was received with great enthusiasm. Reports of similarly successful cases were soon reported in considerable numbers and it was believed that a cure for leucemia had at last been discovered. Unfortunately these sanguine expectations have not proven well founded. One after another, the cases thought to have been cured, relapsed and finally died, so that it seems established that in the x ray treatment of leucemia we have only a palliative, never a really curative agent. Nevertheless it is unquestionably our most potent therapeutic method in this disease. Arsenic, in spite of the occasional good results attending its administration cannot vie with it for a moment. While large statistics are not yet obtainable it would seem that in myelogenous leucemia, the x rays exert a favorable influence in about 90 per cent. of all cases. Often the improvement is striking. The patient becomes subjectively well, his fever ceases, he gains in weight and strength, the hemoglobin as well as the red and white corpuscle count become normal, the spleen shrinks astonishingly, indeed only the demonstration of a slight splenic tumor and of an occasional myelocyte in the blood may serve to remind us that the disease is only latent. Sooner or later, the inevitable relapse occurs and then the x rays usually prove far less effective than when first administered. The total duration of the disease is still usually less than one year, rarely more than two, but meanwhile the patient, instead of remaining a hopeless invalid, has had months of apparent health. In lymphatic leucemia, the x rays have proven far less effective than in the myelogenous type, though owing to its greater chronicity the average duration of life is still longer in the lymphatic than in the myelogenous form. Usually in lymphatic leucemia the blood remains but slightly affected by the treatment and only those lymph nodes that have been exposed to the direct action of the rays show any tendency to atrophy. Occasionally, however, results have been obtained rivaling those in myelogenous leucemia. At all events, even in lymphatic leucemia, the x ray treatment deserves a trial.

As regards technique, a few words may not be out of place. X ray

tubes are conveniently classified as hard, medium and soft, depending upon the degree of vacuum, the latter being higher in the hard and lower in the soft tubes. The vacuum in a tube is, however, by no means a constant factor. Ordinarily it grows steadily higher with constant use, possibly because the molecules of the rarified air are flung from the cathode with such force as to become closely adherent to the glass walls of the tube. If the tube is not given sufficient rest or if other precautions are not taken, the vacuum ultimately becomes so high that no current will pass and the tube becomes useless. Some tubes are provided with special appliances whereby the vacuum can be lowered. Cheaper tubes may be rendered softer by baking, by reversing the current or by more or less prolonged rest. Sometimes, on the other hand, either on account of a perforation or from other causes not well understood, the vacuum in a tube may suddenly fall so low that x rays are no longer given off. It must be re-exhausted. Other accidents such as perforation of the anode may be avoided by interrupting the exposure every few minutes, thus giving the anode time to cool.

The nature of the rays given off by a tube varies with its hardness. Soft tubes produce rays that are most effective therapeutically but on the other hand are most apt to produce burns and have but feeble penetrative power. The rays from a hard tube have great penetrative power and are comparatively innocuous but unfortunately are not very effective therapeutically. The hardness or softness of a tube may be conveniently estimated by examining the shadow of the hand or elbow with a fluoroscope. With a soft tube both bones and soft parts appear opaque, with a medium tube the bones appear dark but the flesh pale, with a hard tube bones and flesh both appear translucent. For superficial work rather soft tubes are coming more and more into favor, but for treating deeper tissues as in leucemia, moderately hard tubes are most useful. Occasionally, as in my third case, where the ordinary tubes fail to produce the desired effect, a decidedly hard tube may be more efficient. For reasons not yet understood, certain individual tubes may combine considerable penetrative with great therapeutic power and when a roentgenologist comes into possession of such a tube he guards it as the apple of his eye.

There is as yet no general agreement regarding the mode of application of the x rays in leucemia. Some advocate few prolonged exposures, others many shorter ones. Some expose once or twice weekly, others daily. On the whole, however, it may be said that the average course of x ray treatment for leucemia consists of a total exposure of from 300 to 500 minutes. The distance of the anode from the skin is usually kept at from 20 to 40 centimeters, but occasionally, in refractory cases, I believe that one is justified in reducing the distance to 10 centimeters, in spite of the increased risk of burns.

This brings me to the dangers connected with the use of the x rays, which must not be underestimated. The commonest accident is the occurrence of the well known x ray burns which may range from a mere desquamation to deep ulcerations that show little tendency to heal. Ordinarily, these burns are due to carelessness or inexperience on the part

of the operator, but they do sometimes occur unexpectedly in spite of careful work and the dread of thus injuring his patient, not to speak of resulting damage suits, is a sword of Damocles continually hanging over the head of the roentgenologist. The risk of causing burns is somewhat diminished, though not obviated, by covering the skin with some substance that obstructs the passage of the softest rays. Bruce suggests linen, Maragliano diachylon plaster; v. Jaksch uses thin plates of silver while I have found, at Dr. H. P. Wells's suggestion, the use of a rubber sheet very satisfactory.

Another danger to the patient is the occurrence of a peculiar type of nephritis, especially after a long series of exposures such as are needed in leucemia. At one time it was hoped that this complication could be avoided if the kidneys were protected from the rays by means of sheet lead, but unfortunately this seems not to be the case. The nephritis is apparently due to the production in the body, after long-continued exposure to the x ray, of toxins whose nature is not understood. As yet we know of no means of avoiding this accident and in the treatment of so grave a disease as leucemia, its occurrence must simply be risked.

Finally it has been found that an overdose of the rays may lead to an atrophy of the bone-marrow, for reasons that will be discussed later. A considerable number of cases have been reported in which the patient after considerable initial improvement suddenly does very badly. The fever which had ceased after the first few applications, suddenly returns, the patient becomes very feeble and a severe anemia, which may bear all the ear-marks of a pernicious anemia, sets in. Sometimes, if the treatment is discontinued, the patient slowly recovers, but sometimes death ensues either from an intercurrent infection or from progressive weakness. In an interesting case reported two years ago by Flesch, a myelogenous leucemia, after yielding readily to the treatment, was succeeded by an acutely fatal lymphatic leucemia. Pancoast and Stengel point out that where the leucocyte count falls very rapidly during the treatment, great caution should be exercised for fear of irreparable injury to the bone-marrow and certainly, when the blood picture has become nearly normal, the treatment must be discontinued for the same reason. It is probably not good therapeutics to try to prevent relapses by means of a continuance of the x ray exposures. It is safer to wait for a recurrence before resuming the treatment.

A discussion of x ray accidents would be very one-sided without a word concerning dangers to the operator himself. I need only refer to the frequent occurrence among x ray operators of burns, atrophies, multiple carcinomata, sterility, injury to the eyes and the like. No one should work with the x rays without being well protected by means of screens, gloves, aprons and lead glass. Our characteristic American recklessness leads us to dispense with adequate personal protection far more frequently than is usual abroad, and so long as this carelessness continues, the present frequent occurrence of injury to x ray workers will not grow less.

In spite of much experimental work, our knowledge of the changes that take place in the leucemic organism under the influence of the x rays

is still incomplete. Heineke was the first to approach the problem from the side of animal experiment. He exposed small animals to the prolonged action of the x rays and found that the leucocytes in the circulating blood diminished rapidly, the lymphocytes disappearing first and the granulated cells later, until finally the blood no longer contained any white corpuscles. At the autopsy, he found nearly complete necrosis of the blood-producing tissues and concluded that the leucopenia was produced by a destruction of these organs. Linser and Helber, however, were able to show that this conclusion was erroneous. They found that at a time when the white corpuscles had nearly disappeared from the circluation, the bone-marrow was still practically intact, the destruction of the bone-marrow occurring only if the experiment was carried on still further. In an interesting series of observations they tried to show that the x rays produce in the blood a so-called leucolytic substance which directly destroys the white corpuscles. If an emulsion of leucocytes obtained either from the blood or from an aseptic purulent exudate was exposed to the action of the x rays and then injected into an animal of the same species, a leucopenia resulted, whereas the untreated leucocytes caused a leucocytosis. Similarily, the serum from an untreated animal injected into another of the same species caused a leucocytosis, but if the first animal had been exposed to the x rays, a leucopenia resulted. They concluded that the x rays by their direct action upon white corpuscles produced a leucolytic ferment and that this ferment like other similar ones could be inactivated by heat and could be made to produce its own antitoxin. Milchner and Wolff repeated these experiments in somewhat greater detail with similar results. Hoffmann added to the blood of an untreated case of leucemia some serum from a case that had been greatly improved by means of the x rays and observed a rapid disintegration of the white corpuscles, while Curschmann observed in rabbits a temporary diminution in the number of white corpuscles when the serum of an x rayed leucemic was injected. This failed, however, to occur when the serum of an untreated case was used. In this country Capps and Smith made experiments along similar lines with the same result. They also injected into an untreated leucemic patient, blood-serum from another individual who had been successfully treated by means of the x ray. After each injection, a rapid and considerable fall in the leucocyte count was observed, indicating to their minds that the serum of the x rayed patient contained a specific leucocyte-destroying substance due to the action on his blood of the x rays.

Unfortunately none of these observations are conclusive. In the first place none of these observers report more than very few experiments in any one direction, so that accident or errors of observation cannot be entirely excluded. Thus when they obtain a destructive action upon white corpuscles in vitro by means of the x rays or of the serum of x rayed animals or human beings, they do not speak of any precautions taken against bacterial contamination. It is, however, well known that certain widely prevalent bacteria, such as the bacillus subtilis, destroy leucocyte emulsions in a test-tube very rapidly. Again, their experiments on rabbits are vitiated by the fact that for physical reasons the leucocyte

count in the peripheral blood of rabbits varies widely from hour to hour. Finally, the observations of Capps and Smith, that the serum of an x rayed leucemic patient injected into an untreated leucemic individual produced a rapid if temporary fall in the leucocytosis, has no significance so long as we do not know the effect upon such an individual of injections of normal or of untreated leucemic blood. It is, therefore, not surprising that Klieneberger and Zoeppritz, in a much more careful and extensive series of observations than those of their predecessors came to a diametrically different conclusion. Neither in the test-tube nor in animal experiment were they able to find that the blood-serum of x rayed animals nor that of leucemic patients so treated had any leucolytic power whatever. And there the matter rests at present.

A much more profound insight into the metabolism of leucemic patients under the influence of the x rays has been made possible by careful study of their urines. Koeniger, Rosenberger, Rosenstein and Gualdi, who have done the best work along these lines, have made nearly identical observations. It will be remembered that the uric acid and the purin bodies in the urine are apparently formed mainly from the breaking down of nuclear substance. In leucemia these substances are excreted in excessive amount, evidently because of the great number of leucocytes, rich in nuclear matter, that are continually breaking down. When the x ray treatment is begun in a case of leucemia and the white corpuscles in the blood begin to diminish considerably, there is at first a marked rise in the amount of uric acid and of the purin bodies in the urine. This is evidently due to a great destruction of leucocytes. As, however, the leucocytosis diminishes still further, the excretion of uric acid and of the purin bodies approaches the normal and when the patient has been nearly or apparently quite cured, an abnormally small amount of these substances is excreted in the urine. The natural interpretation of these results is that at first the x rays exert a destructive action upon the leucocytes in the circulation either directly or by means of a leucolytic ferment or in some manner not yet known. Later, however, this action upon the blood itself ceases and is replaced by an inhibitory action upon the bone marrow apparently due to the formation of a myelotoxic substance in the blood, since this effect occurs even when the bones themselves are protected from the direct action of the rays. This theory is rendered the more seductive by the fact that both in animals and in leucemic patients an excessive dosage of the rays has been followed by bone-marrow atrophy. As yet, however, the evidence in favor of this interpretation of the action of the rays upon leucemic blood rests upon purely circumstantial evidence. The direct evidence in favor of the existence of either leucolytic or myelotoxic substances in the blood of these patients is not yet conclusive.

THE USE OF THE X RAY IN GASTRIC DIAGNOSIS.

By Horace W. Soper, M. D., of St. Louis.

In order to comprehend the method of examination by means of the Röntgen Ray, we must remember the law that substances of like atomic weight and thickness cast the same shadow; that for example, the lungs are visible because they are surrounded by tissues that naturally differ from them in density.

In as much as the gastrointestinal tract including the oesophagus is bordered by structures of much the same density, it can only be made visible by introducing some substance which has either a much higher or lower specific gravity. The agents usually employed for this purpose are air and bismuth, either the metal or the subnitrate.

In 1896, Wegele[1] closely followed by Lindemann[2] and G. Rosenfeld, succeeded in examining the stomach by means of x rayed sounds. Then Boas and Levy Dorn administered bismuth capsules. Rosenfeld[4] outlined the air inflated stomach. Holzknecht[5] in the year 1900 published his great work on "Testing the Functions of the Oesophagus by Means of the Bismuth Bolus," a method by which the diagnosis of change in caliber, form and position of the oesophagus can be readily established.

Rieder[6] was the first who had the courage to give large doses of bismuth subnitrate. He administered a large meal which completely filled the stomach, consisting of thirty to forty grams of the subnitrate intimately mixed with 400 cc. of finely ground rice or meal mush. The stomach can by this means be beautifully outlined.

Rieder employed only the radiographic or photographic method of examination. Holzknecht[7] developed the radioscopic (fluoroscopic) method and opened up a whole world of diagnostic possibilities. By this method the x ray tube and the fluoroscopic screen are so adjusted as to utilize the parallel rays and at the same time to avoid any distortion of the shadow of the object. The shadow of the bismuth mush-filled stomach can thus be studied, and the effects of palpation, action of food, respiratory movements, abdominal contractions, peristalsis, etc., can be observed.

Rieder and Goldammer[8] have advocated especially the radiographic method, and this is certainly of value where fine definitions are desired, and where by instantaneous exposure the stomach may be caught at a point in its peristaltic excursion, as in the beautiful picture shown by Rieder[9] in his latest publication.

The great advantage of the fluoroscopic method is that by palpation, i. e. by moving the bismuth mass in various directions, the changes produced in the stomach can be observed directly under the eye of the operator. By strong contraction of the abdominal muscles (Bauchein-ziehen Holzknecht) the stomach is elevated a distance varying from two to six inches. This is of especial value in determining the question of adhesions of the stomach with neighboring structures.

Fig. 1.—Holzknecht's normal form of stomach (erect posture).

Many observers have confirmed Holzknecht's researches, notably Groedel[10] (3) of Nauheim, Jolasse,[11] Levin and Barrett,[12] and Hulst[13] and Pfahler[14] of this country.

Their results may be summed up as follows:

1st. The diagnosis of the relationship of the stomach to the abdominal walls, the diaphram, the large intestine, liver, etc.

2nd. The study of the effects of massage, electricity and other stimuli upon peristalsis.

3rd. The motility, i. e. the time in which foods leave the stomach, has been studied chiefly by Jolasse[11] and Schwarz and Kreuzfuchs.[15] Jolasse's results were, briefly, that after the administration of the bismuth meal, normally no shadow should be visible after three hours in males and four hours in females. Six hours after the Leube midday meal no food should be present.

4th. The differentiation between intra and extra ventricular tumors.

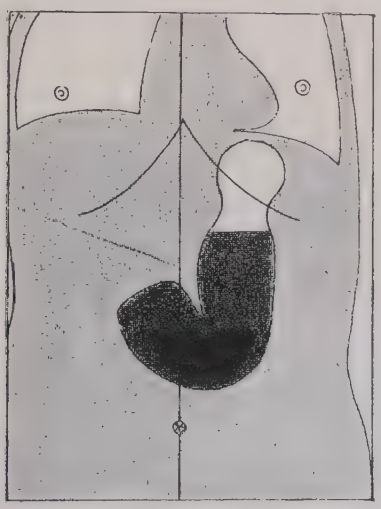

Fig. 2.—Holzknecht's usual or "fish-hook" form of stomach (erect posture).

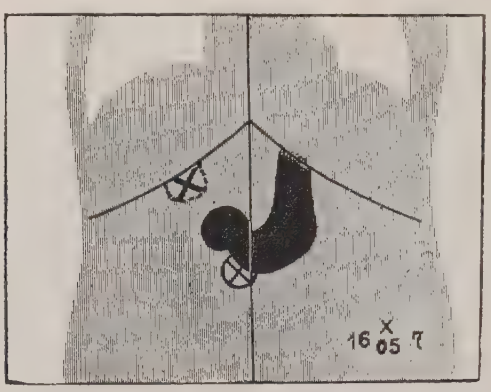

Fig. 3.—Upper x marks a tumor in the region of the gall bladder not connected with the stomach. The lower x indicates a second extra-ventricular growth. (Holzknecht.)

(Holzknecht.) It can be readily ascertained whether or not palpable epigastric tumors are connected with the stomach.

5th. The differential diagnosis between extra and intra ventricular localization of other clinical symptoms. For example: It is of value to know whether or not an area of localized pain or tenderness to pressure, is situated in the stomach.

6th. The diagnosis of growths encroaching upon the cavity of the stomach; this refers particularly to carcinoma. Should the growth project into the large air bubble, which is always visible in the cardiac portion of the stomach, it becomes distinctly outlined. In growths near the pylorus, the loss of peristalsis is a valuable sign of infiltration of the wall. Anti-peristalsis means pyloric-stenosis. Projections of the growth causing irregularities in the cavity are also of value. Quite often small nonpalpable growths become palpable under the x ray probably due to the concentration of the attention of the observer.

7th. The judgment of size, form and position of the stomach. This is studied chiefly with the patient in the erect posture. Rieder, Groedel and others maintain that the "fish-hook" or siphon form is the normal one.

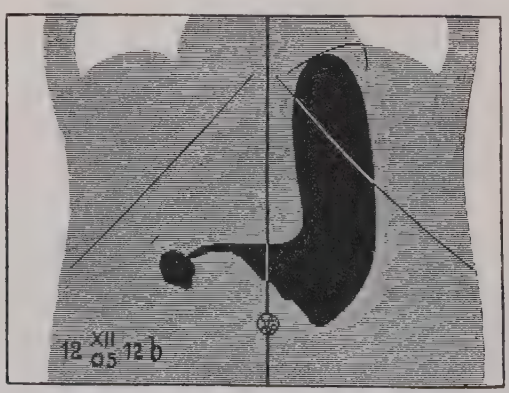

Fig. 4.—Carcinoma of the pyloric region. The tumor projecting into the cavity leaves but little space to be filled by the bismuth mixture. (Holzknecht.)

Holzknecht found this same form in eighty per cent of the adults he examined, and terms it the usual one, corresponding to a certain degree of visceral ptosis, which occurs in this percentage of healthy persons. The normal type, which Hulst designated the "steerhorn form," Holzknecht found in that small per cent (15-20) of persons with strong well developed abdominal muscles exhibiting no signs of ptosis. Pfahler of Philadelphia, ably supports this view.

Holzknecht basing his judgment upon his original studies of the physiology of respiration concludes that the great majority of healthy adults exhibits a condition of moderate enteroptosis, the cause of which lies in a relaxation of the abdominal walls, producing changes in the intra abdominal pressure thus leading to a ptosis of the viscera. This in turn causes the narrowing and elongation of the thorax; in brief the well known clinical type designated by Stiller[16] as asthenia universalis congenita, or habitus enteroptoticus, which has provoked so much discussion. It is interesting to note that Virchow[17] as early as 1890 made practically the same statement, explaining it as a concomitant of the general muscular weakness or relaxation that the greater part of civilized mankind exhibits. Thus it appears that very early in life the stomach begins to gradually deviate from its seldom seen normal form, and assumes the fish-hook or siphon shape. As Holzknecht emphasizes, this position of the stomach is not a genuine ptosis, but because of the fixation of the cardiac portion and the small degree of excursion permitted the pylorus, the condition is really one of suspension. That in severe grades of gastroptosis or "relaxatio ventriculi" (Holzknecht), treatment directed towards elevating the ptotic small intestines, and thus restoring the cushion upon which the stomach normally rests, is the most efficacious: that under strong contraction of the abdominal muscles (Baucheinziehen) the stomach can be seen to assume the "steerhorn" or normal form.

8th. The observations of Hemmeter[18] upon the precipitation of the bismuth in cases of gastric ulcer, have not been confirmed by other investigators. Schwarz's method of estimating the degree of acidity (H. Cl.) by means of connective tissue capsules containing bismuth has not been verified.

It therefore appears that the x ray, while not displacing other physical and chemical diagnostic methods, is an extremely valuable addition to our equipment.

Particularly in consideration of the modern improvements in technique and protective appliances, rendering the procedure safe for both operator and patient, is it destined to play an important rôle in the difficult field of diagnosis in gastrointestinal disorders.

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MOULAGES OR WAX MODELS.

By J. J. Houwink, M. D., of St. Louis, Mo.

While visiting the dermatological clinics in Europe, I was very much impressed by the very beautiful collections of moulages, or wax models of skin diseases and syphilitic eruptions which I saw in the clinic of Professor Lassar, in Berlin, in the University Clinic for Skin and Genito-Urinary Diseases, the Charite Hospital, in Berlin, and in Das Kaiserin Friedreich's Haus in the same city. Before leaving home for my European trip, my attention was called by my co-worker, Dr. J. H. Duncan, to the importance of these collections. He had seen the collections of Professor Lassar, and those in the Hospital St. Louis in Paris, and in Das Algemeine Krankenhaus in Vienna. Besides these large collections of moulages, there exists still one in Neisser's Clinic in Breslau, and a few small ones in other cities on the continent of Europe and in England.

A complete collection of this character does not exist in the United States. A few dermatologists in Eastern cities have some specimens, bought in Europe, but a regular museum in this line is not found on this side of the Atlantic.

In the large collections mentioned, one can find specimens of every skin disease known, the most common and the most rare, and the different varieties and stages in which the diseases occur.

The benefit that is derived by our colleagues of the old country from these collections is very great. Not only students, general practitioners and specialists, but also the public in general, appreciate them and profit by them.

Anxious as I was to get a museum of wax models in St. Louis, it would be practically impossible for an individual to buy a large collection, as the selling price is quite high. In Germany these specimens sell for 15 to 30 dollars each, which would mean for a collection of a thousand specimens, at least twenty thousand dollars. In France the prices are still higher.

I therefore tried to learn the technique of making wax models and, through the courtesy of Mr. Kasten, the artist and sculptor at Professor Lassar's Clinic, I was able to accomplish this. Of course, a simple knowledge of the technique does not make one an expert, by any means, and it will take a long time and hard work, study and much disappointment, to become proficient. Besides that, it is necessary that one be somewhat of an artist and possess an analytic eye for colors and, last but not least, be conversant with skin lesions.

It is true that Mr. Kasten, in Berlin, Mr. Baretta, who made the famous collection of moulages for the Hospital St. Louis, in Paris, or any other of the mouleurs in Europe, are dermatologists. They are all artists and sculptors and knew nothing of skin diseases when they started to make wax models; nevertheless, they are dermatologists now in a sense. Having made thousands of specimens, they had to look closely at the eruptions they wanted to copy and gradually, while doing this, they be-

came able to make a diagnosis as if they had studied dermatology in the ordinary way. It only required more time and gave them more disappointment than it would have done had they been dermatologists before commencing this work. And this is not strange, as they had to learn what they were trying to copy. Not understanding the clinical features and the pathology of the disease, the mouleur is apt to make mistakes that a dermatologist would not make.

Take, for instance, a case of lichen planus, with its papules, purplish-blue, having an irregular base, flat glistening tops, often-times umbilicated, and covered with minute scales. A mouleur who is not a dermatologist would certainly not notice all these peculiarities, and while his wax model might show the lichen planus eruption very artistically at a distance, it would not be lichen planus on close examination. Take a case of scabies, with its multiform eruption: vesicles, papules, pustules, crusts, etc., where the typical lesion is oftentimes masked by the secondary eruption, so that mistakes in diagnosis are quite common in this disease. We all know that the typical lesion in scabies is only the deep-seated vesicle at the end of a crooked, dotted line—the cuniculus—through which the acarus scabiei burrowed, and where she deposited her feces and eggs, while she herself is in the vesicle. An artist, not knowing these facts, would certainly overlook these most important lesions, and his moulage would not be one of scabies. So I could give a great many examples to show that a mouleur ought to be a dermatologist in the first place. The best mouleur of course would be a dermatologist who is an artist at the same time. Now, will it pay a specialist to do this work, to give his time and efforts to this art; will it benefit him and others enough for the time he devotes to it? I certainly would answer this question in the affirmative.

Painting a wax model means for him that he has to study the color of the lesions he has before him more closely than any clinician would do. He must pay more attention to the shades in color, the shape, arrangement, distribution, and other peculiarities of the primary and secondary lesions, than he would do while simply trying to make a clinical diagnosis. In this way he will exercise the analytic power of his eyes all the time; he learns to see better, which is of great benefit, especially for a dermatologist. He simply studies while doing this work.

But not only is the making of these wax models of value to the specialist. If he has a large collection, including the rare skin diseases and rare varieties of the more common ones, that are not diagnosed by the general practitioner and therefore referred to him, he will have a great help in his collection. For, looking at his specimens occasionally, he remains familiar with them, even if he sees these rare cases only very seldom in his practice, and he will be apt to think of them whenever they may come to him. He will therefore make fewer mistakes in diagnosis than he would do otherwise. He will better keep in mind the different varieties and stages of one and the same disease when he sees them off and on together. He can, making these wax models himself, follow the course of the disease and notice the results of his treatment at any time, if he only makes a series of models of the case under observation.

If he wishes to report or demonstrate an important case, he will be able to do this at any time, not being dependent upon the patient, whose eruption might have changed or disappeared in the meantime, or who might not like to be demonstrated personally.

If he is connected with a medical school, he can show his students not only the common skin diseases that come to policlinics daily, but also the rarer ones that may not be seen often in a life time. Any disease he may lecture upon can be demonstrated as the moulages are always at hand, which is not the case with patients. The teacher with a large collection of wax models can therefore give more to his students than the one who has only his small policlinic to draw from. For no photograph, or colored print, can give the correct impression that a moulage does of dermic lesions.

These models are of great value also to the general practitioner, who naturally forgets a great deal of what he learned in college of skin diseases and as he has not sufficient opportunity in his general practice to come in contact with them. Visiting a collection of wax models will therefore be of the greatest help for him, as they will refresh his memory and keep him posted in diagnosing those cases which come under his care.

Finally, a collection of wax models is of value to the general public. The collection of moulages in Das Kaiserin Friedreich's Haus in Berlin, is open to the public and certainly has a good educational influence on every visitor. Young men and older ones, too, would be a great deal more careful if they visited, now and then, a museum of this character where they can see what it means to expose themselves to venereal diseases. There is no better education for the public, in guarding it from the dangers of syphilis, than showing, cool and naked, what syphilis means.

As it may interest the profession to know how these wax models are made, I will try to give a description of the technique. Having selected the part of the body of which a reproduction is to be made, I first cover this part with a thin layer of olive oil, which I apply with an ordinary, stiff, painter's brush. The purpose of this is to prevent the material of which I make a negative cast from sticking to the skin. The patient is now put in a convenient position so that he can keep the part I want to reproduce perfectly still while I make the negative cast. For instance, if I want to make a cast of his hand, I let him sit down and let his forearm and hand rest on a table. If I want to make a cast of his face, chest or abdomen, I let him lie on his back on a table, and so on. The position should always be so that it is possible for the patient to remain still for about ten minutes. Having the patient in the required position and the part oiled, I then proceed to make the material for the negative cast. For this purpose I use a very fine grade of plaster of Paris. This is mixed thoroughly with sufficient water to give it the consistency of thick buttermilk. This semi-liquid plaster of Paris is now brought on the oiled part of the patient's body. I do this with a spoon, or the hand, and have to do this as quickly as possible, as the plaster of Paris begins to harden very soon. The patient must be told to keep perfectly quiet under this procedure and not to get frightened when he feels the sensation of heat

Fig 4.
Lichen Ruber Planus
Fig 2.
Pemphigus.
Fig 5
Tuberculosis verrucosa cutis

to the part. This heat, caused by the chemical changes in the plaster molecules uniting with water, will never injure the patient and it is better to tell him this, otherwise he might not keep quiet. This is especially true when a negative cast of the face is to be made.

When the whole part is covered with a layer of plaster of Paris of about one inch thick, I allow this to harden, which takes from five to ten minutes. By scratching with the fingernail or by knocking on the plaster of Paris, I can judge if it has hardened enough to be taken off. If I think it hard enough, I take the negative cast from the part and immerse it in warm water. I leave it in the water until this is cooled off. The negative is then dried and ready for further use.

The technique described applies only to a case where I want to take only one surface. If I want to make a whole hand, foot, leg, etc., I must make two, three or more negative casts from different sides and later put these casts together, when I want to make the positive in "wax."

The material I use for making the positive is a mixture of beeswax, ceresin or Japanese wax, and paraffin, in different proportions. This material is melted in a waterbath or large milk boiler. When melted I add some paint to it, to give it the color, as much as possible, of the skin of the patient. I most often use a certain amount of zinc white, to make the "wax" less transparent, and some red or brown paint, according to the case. This paint—the ordinary oil paint in tubes as artist painters use it—is mixed in a spoon with some turpentine, and then thoroughly mixed with the melted "wax."

Having the mixture ready, I take my negative of plaster of Paris and put it in hot water. The pores will fill up with water and after taking the negative out of the water the surface is quickly dried with a towel and then oiled, as I oiled the skin. This will prevent the "wax" from sticking too tightly to the negative. The melted wax is now poured into the warm negative and allowed to harden, while the negative is constantly moved, so as to get an equally thick layer of wax everywhere. When the wax has hardened to a certain extent, I immerse negative and wax in a basin of warm water and let this cool off by adding cold water. The wax positive is now loosened from the plaster of Paris negative. This has to be done very gently and therefore I do it under water, so that the water coming gradually between the positive and the negative helps the loosening of the two parts. I then leave the wax positive, still in the cold water, for some time, so that it becomes thoroughly hardened, and then take it out. After drying it with a towel, I cut off the rough edges, shape it as I want it, and model it, where it may be necessary.

The wax positive is now ready for painting. However, I most often nail it on a black board before painting it, so that I need not handle it any more with my hands. The paint I use is the same I mentioned before, and is laid on the wax with camel's hair brushes. I use about ten different kinds of paint, by mixtures of which I can make every shade in color that I may need. Crusts, scales, blebs, etc., are put upon the wax model later, by dropping melted paraffin on the places where I want them, and they are then painted. To make some places glistening, I simply apply some varnish to them after they have been painted. To go deeper into this part of the technique would not be of value without a practical demonstration and I must be content with this short outline, which gives at least some idea of how these wax models are made.

Humboldt Building.

MEDICAL AND SURGICAL PROGRESS.

INTRAVENOUS INJECTION OF STROPHANTHIN FOR CARDIAC INSUFFICIENCY.

A REVIEW OF RECENT LITERATURE.

By Wm. Engelbach, M. D.

1. The Value of Strophanthin, Administered by Intravenous Injection (*Folia Therapeutica,* January, 1908).
2. Ueber Intravenose Strophanthininjektionen.—Fraenkel (*Muenchener Med. Wochenschrift,* No. 41, October, 1907).
3. Intravenose Strophanthininjektionen.—Starck (*Deutsch. med. Wochensch.,* No. 12, 1907).
4. Neue Mitteilungen zur intravenosen Strophanthintherapie. Hedinger (*Muenchener med. Wochenschrift,* No. 41, 1907).

The essential requirements for a cardiac stimulant are prompt action, secure dosage and freedom from injurious effect on other organs. It is well known that both digitalis and strophanthus in the form of tincture or infusion are slow in their action, unreliable in strength, and irritate the digestive system. These considerations have tended to the improved pharmaceutical preparations of digitalis and strophanthus in the matter of standardisation. In 1875 the active principle of digitalis was isolated, in insoluble crystalline form, and was termed digitoxin. This is a glucoside, allied to digitalein and digitalin. In 1904 Cloetta isolated another substance known as digalen, which is practically a soluble digitoxin. One cubic centimetre of the glycerine solution is equal to .3 mg. of digitoxin. The effects of its intravenous injection are in evidence within a few minutes, the main disadvantage of its employment being that relatively large doses are required, i. e. 1.5—4.5 c. c. In the year 1885 Fraser separated the active glucoside of strophanthus. The Strophanthin-Boehringer is the most convenient preparation of this glucoside, being obtainable in sterile solution in glass bulbs, each containing an amount equivalent to 1 mg. The clinical records of its use by intravenous injection are most striking. Fraenkel, after an experience of fifty cases, reports that within a few minutes the pulse becomes strong, and the cyanotic symptoms are relieved very rapidly. The injections gave rise to no pain, but in a few cases rigors and pyrexia followed. The experiences of Mendel in five cases were, however, less encouraging. In one case the improvement only lasted two days, and in three others no effect at all was produced. This observer advocated the active principles of digitalis. A recent article by Starck, recording seven cases, concludes that strophanthin injections tend to strengthen the pulse, reduce its frequency and make its rhythm regular. The breathing is improved, the congestion soon diminishes, diuresis is established—in a word the whole circulation is conducted in a healthier manner. These reports determined Dr. Ludwig Schoenheim to give strophanthin a trial in the wards of St. Stephen's Hospital in Budapest. Eight cases were submitted to careful observation. Medicine was withheld for a few days before the injec-

tions were given, the twenty-four hours urine measured, pulse rate noted, and blood pressure taken with the Riva-Rocci instrument. The Strophanthin-Boehringer was injected with full aseptic precautions into the median vein. The patients all had cardiac disease with such symptoms as low blood pressure, irregular pulse, ascites, anasarca and hepatic enlargement. In three cases only one injection was given, because no manifest improvement followed, the fall of the pulse rate noted by other observers was not seen in this series; but an increased blood pressure was very striking, even to the extent of 60 mm. of mercury. This change could be detected by the finger in the course of a few minutes. Most of the cases also exhibited a marked increase of diuresis, the amount of urine passed increasing two and threefold. When the blood pressure failed to rise there was, however, no diuresis; but the cases which presented an increased blood pressure and diuresis showed also great improvement in general symptoms, and these continued to improve with ordinary medical treatment. It should be said that one case suffered from rigors and pyrexia after the injection, and another had nausea, vomiting, giddiness and headache. These symptoms only lasted a few hours. The following conclusions may be formulated in regard to strophanthin: (1) An intravenous injection should be given in cases of cardiac failure which do not yield to ordinary medical measures. (2) Strophanthin raises the blood pressure, produces diuresis, relieves congestion, but does not influence the pulse rate. These effects last a few days, and if necessary the injection may then be repeated. (3) In some cases rigors, giddiness, vomiting and headache may follow the injection, but these symptoms subside within a few hours. Dr. Max Hedinger deals with the objections which have been offered to its use, viz.: attacks of pyrexia or the onset of rigors. These can be avoided by using a carefully sterilised preparation. The author quotes an instructive case. It concerned a male, aged 57, suffering from granular kidney or arterio-sclerotic origin and cardiac failure. In 1900 he experienced shortness of breath and palpitation; in 1905 these symptoms grew worse, culminating in attacks of angina pectoris in the following year. When he came under the care of the author, there were dyspnoea, oedema, insomnia, with intolerance of food and medicine. The first cardiac sound was indistinct, both sounds at the base were accentuated. The pulmonary sounds were louder than the aortic, the beats were irregular, 104 per minute, and pulse tension was very high. The urine contained much aubumin, with hyaline and granular casts. Four minutes after the injection of 1 mg. of strophanthin the pulse was reduced to 80 per minute, and the respiration to 24. A good night's rest followed, and free diuresis was established. The patient was able to lie down flat instead of being propped up. The benefit continued as long as the injections were continued. The conclusions arrived at may be summarised as follows:

(1) Strophanthin acts quickly and effectively in cases of circulatory failure, as evidenced by his last series of cases. (2) The undesirable sequelæ—pyrexia and rigors—are due to bacterial contamination of the solution. (3) The effect of the injections does not become less as they are persisted with, unless, of course, the condition of the patient deteriorates rapidly. (4) In doses of 1 mg. every twenty-four hours there is no fear of any toxic cumulative action. (5) The intravenous injection of strophanthin possesses advantages over the administration of digitalis by the mouth.

SARCOMA OF THE LONG BONES.

A REVIEW OF RECENT LITERATURE.

By Malvern B. Clopton, M. D.

1. Sarcoma of the Long Bones, Prognosis, Treatment and Diagnosis.—Coley (*An. of Surgery*, March, 1907).
2. Inoperable Sarcoma.—Coley (*Med. Record*, July 27, 1907).
3. Sarcom der langen Röhrenknochen.—Von Haberer (*Zeit. f. Heilkunde*. Bd. XVII Hft. 3).
4. Ueber die Behandlung der Sarcome der langen Röhrenknochen.—Brochard (*Zentr. f. Chir.*, 1907, No. 45, p. 1327).
5. Conservative Operations on Bone Tumors.—Bloodgood (*J. Am. Med. Assn.*, Feb. 1, 1907).
6. A Conservative Treatment of Sarcoma.—Babcock and Pfahler (*Surg. Gyn. & Obst.*, Feb., 1908).

In an exhaustive paper in which he reviews his experience with sarcoma of the long bones Coley states that he has come to the conclusion that resection should more frequently be practiced, particularly in those cases of myeloid tumors of the tibia and radius, following the practice suggested by Mikulicz and other German surgeons. He believes that the mixed toxins of erysipelas and prodigiosus used after operation will greatly widen the limits within which operation of resection may be safely employed. Trauma is considered as a pertinent etiologic factor (47% of his cases) and in his belief sarcoma is of microparasitic or infectious origin. In over two-thirds of his cases the tumor has started in the ends of the bone, the lower end of the femur and the upper end of the tibia and humerus. In a few cases especially of the femur and tibia the growth begins in the middle of the bone and here is nearly always of the periosteal type. On several occasions fever has accompanied sarcoma of the femur (10%) and in some cases of bone origin it has gone to 103°, this tendency to high temperature being noted in the more rapidly growing variety. Leucocytosis may go to 20,000, the lymphocytes and eosinophiles increasing. The x ray may be of value in showing periosteal or tumors of central origin but in the early stage it may be not only of little help, but in some cases entirely misleading. To differentiate sarcoma and bone syphilis is not nearly so difficult, the history with other evidence of the disease, and the location of the growth in the shaft of the bone and the decided help of the x ray showing a larger amount of new bone formation in syphilis than in sarcoma are deciding aids. The most conclusive and useful means of diagnosis in all conditions is the removal of a portion of the tumor for examination. In bone cysts the differential diagnosis is often impossible without a careful microscopic diagnosis, but inasmuch as only 31 cases of this disease are collected in the literature its rarety must be borne in mind, and nearly half of these were of the upper end of the femur. Cysts occur in sarcoma, so it is necessary to microscopically examine the wall of what might be considered a benign cyst.

Over half of the entire series of 69 cases were of the femur, and amputation at the hip was performed 13 times, high amputation through thigh 10 times. Of the 13 hip joint amputations only one was cured (5 years) and without exception the others died within a year. Of the 10 high amputations one died two years later, the others either died within

a year or are still under treatment, less than a year intervening since operation. Toxins were used in most cases.

Sarcoma of the humerus, is rare and exceedingly malignant, and of the 13 cases observed, 6 were amputated at the shoulder (one death from shock) and resection was performed in 3 cases. The amputated cases died before 10 months, 2 of the resected cases were lost sight of, the third (a giant celled osteo-sarcoma) after resection, which was not considered to have completely removed the growth, was given toxins and the patient remained well 9 years later.

With the exception of the femur, the tibia is more frequently affected than any of the long bones, the tumor is usually of central origin (egg-shell crackling elicited) and the giant celled type, situated at the upper end and does not early involve the joint. Amputation above the knee was done in 6, and the results were fairly good, excision was done twice in one with recurrence that yielded to the toxins. Of his 69 cases, 10 remained well over three years—of these 5 had the benefit of the toxins either with or without operation.

It is not out of place to mention at this time, Coley's experience with the toxins of erysipelas, and prodigiosus in inoperable sarcomata, which were located in many parts of the body, not exclusively in the long bones. The toxins are prepared differently than at the time of his first reports, so that now they are more or less standardized. The prodigiosus is most effective when the red color is the most pronounced and it is now grown separately, and later added to the culture of the streptococcus in given amounts. The injections are begun with a ¼ minim dose and increased by this amount when injection is made into the tumor, and by ½ minim when the injection is remote from the growth, and the best results are obtained when severe reactions are obtained, (temperature from 102° to 105°). Periods of daily or tri-weekly treatments lasting several weeks are repeated after monthly intervals.

He has observed personally 42 cases, successfully treated, 21 patients were well from 5 to 14 years, 26 from 3 to 14 years and 10 cases well from 10 to 14 years, of these cases 17 were round celled sarcoma, 17 spindle celled, 2 mixed celled, 1 chondrosarcoma, and this same proportion holds in the 66 cases successfully treated by other physicians. As an adjunct to the surgical treatment of operable bone sarcoma the toxins are a great help.

The material for von Haberer's paper was 18 cases and of these 5 were amputated and 3 refused treatment. The remaining 10 cases were treated by excision of the growth, and of these 3 were later exarticulated for recurrence, and a fourth case was similarly treated for a supposed recurrence, but on examination of the amputated member it was seen that the trouble was an osteomyelitis, developed in the bone which had been implanted in the defect. This case remains well. The 6 cases treated by excision remain well over a period varying from 4 months to 4 years. Of the amputated cases—2 are well after several years, and 2 have recurrences, and one is lost. v. Haberer believes that in view of these facts that amputation becomes less frequently indicated and that conservative resection should be more used, particularly as it is made more definite by means of the x ray to bound the growth of the bones.

Brochard believes that it is a mistake to classify tumors of the long bones according to their cell constituents as they usually contain cells of diverse types, but to determine the malignancy of a growth the macroscopic appearance, the part of the bone from which they arise, and the more or less approach of the structure to the stroma, are the useful data.

The tumors which arise from the periosteum are the most malignant, and those tumors that remain inside the bone are the least malignant. The tumors whose extention is within the bone offer the best chance for conservative treatment. Dissemination in the marrow of the bones is rare, usually the growth is in direct connection with the primary tumor. Conservative operations are not so severe, and offer just as good results as mutilating amputations, and functional results are by far the best, particularly when the defects are repaired by the plastic implantation of bone after operations upon the diaphysis. With Brochard conservative operations are the rule, either resection or enucleation, each having their indication according to the nature of the growth. He reports 5 healed cases handled conservatively, of these 2 were periosteal sarcoma, one of the humerus, the other an infiltrating growth of the shoulder girdle. Another case was a central myelogenous sarcoma of the ulna for the most part encapsulated. The ulna was resected part of the radius chiseled away and a metacarpal bone, removed subperiosteally transplanted into the defect of the ulna.

Bloodgood notes that with rare exceptions permanently cured patients suffered from tumors of similar pathologic anatomy, and that such cures were accomplished in properly selected cases by conservative operations as well as by amputation. When cures were not accomplished the tumors were of similar structure, and in spite of high amputation the patient succumbed to internal metastasis.

In this article are considered several pathologic conditions, such as dentigerous cysts and adamantine epithelioma, which do not need be reviewed in this abstract. Giant celled sarcoma he notes as usually arising in the medullary cavity of the long pipe bones, although periosteal growths have been recorded. It is the most common form of epulis, which may be regarded as a periosteal growth of the alveolar border. In the fresh state it is hemorrhagic and mottled, and the tumor is friable. When it occurs as a medullary growth it expands the bone and grows slowly. The diagnosis had best be confined by frozen sections. Curetting has permanently cured, still recurrences have followed the curetting, but the cases were later permanently cured by curetting, resection or amputation. In over 100 cases of pure giant celled sarcoma none has given metastasis. It seems justifiable at the first operation to be conservative, either curette or chisel, removing a zone of bone beyond the tumor, or subperiosteally resect, if the bone covering is thin. Myxoma which is rare should receive the same treatment as giant celled sarcoma. Myxochondrosarcoma gives excellent results after resection. Periosteal osteosarcoma is the only tumor associated with the formation of new bone, and consequently is the only one which should be called osteosarcoma. It is most commonly met with on the lower jaw, does not give metastasis and can be cured by local resection. Exostosis bursitis may clinically resemble a rapidly growing sarcoma, but can be distinguished in x rays taken in various directions, which may show the exostosis, or by an exploratory incision. Bloodgood has never seen a permanently cured malignant sarcoma of the bone, and thinks it is suggestive that in this more malignant group studied in the literature, more cures have been accomplished by local resection than by amputation. The medullary growth eats its way through the cortical bone and does not produce expansion, pathological fracture may be the first symptom. The periosteal growth rapidly infiltrates the bone beneath, and the x ray gives the evidence of bone destruction.

Babcock and Pfahler divided sarcoma into two clinical classes, the

first or relatively benign, comprising the majority of central sarcomas of long bones, the myelomas, giant celled sarcomas and certain fibrosarcomas, which may be eradicated by simple resection, enucleation or at times curettage; the second group or very malignant sarcomas including the periosteal growths which are early fatal despite most radical resection or amputation. High amputation, usually unnecessary and unjustifiable for the more benign sarcomas, is usually unavailing against the more malignant. On the other hand malignant sarcomas are prone to spontaneous disappearance, or recede after x ray treatment, or the injection of toxins. The authors draw attention to the relation of trauma to sarcoma and accord to operative trauma the reason for the return of the sarcoma in the scar. The life and growth of the primary sarcoma rarely cause cachexia or a fatal issue, and the authors believe that the death and decomposition of the tumor cells do produce cachexia and occasionally death. Therefore they propose to treat sarcoma by a combination of judicious subcapsular enucleation with a prolonged Roentgenism, the topical application of methylene blue or pyoktanin and occasionally the administration of certain drugs and toxins, and offer results in malignant or recurrent cases superior to those obtained by the most desperate and extensive surgical eradication.

ROENTGEN DIAGNOSIS OF THORACIC LESIONS.

A REVIEW OF RECENT LITERATURE.

By E. H. Skinner, M. D.

1. A Vertical Orthodiagraph.—R. Keinbock (*Archives of the Röntgen Ray,* March, 1908).
2. Physiologic and Clinical Observations on the Alimentary Canal by Means of the Röntgen Rays.—Geo. E. Pfahler (*J. A. M. A.,* Vol. xlix, pp. 2069).
3. Ortho-Röntgenography.—Franz M. Groedel (*Archives of the Röntgen Ray,* November and December, 1907).
4. The Röntgen Method in the Surgery of the Chest.—Carl Beck (*Surg. Gyn. & Obs.,* Vol. V., No. 6).
5. Fistulous Tracts, Tuberculous Sinuses and Abscess Cavities. A New Method of Diagnosis and Treatment by Bismuth Paste.—Emil Beck (*J. A. M. A.,* Vol. L., No. 11).
6. The Relations of the Diaphragm as Revealed by the Röntgen Ray.—Sidney Lange (*J. A. M. A.,* Vol. L., No. 9).

An increasing confidence in the ability of the roentgenologist is stimulating the profession to patronize the roentgen laboratory for aid in the diagnosis of thoracic lesions. This in turn has called forth the best efforts of the roentgen worker with the idea of simplifying the cumbersome apparatus of early workers in radioscopic and radiographic chest and abdominal work.

The principles involved include the proper protection of the patient and of the operator; a position of ease and comfort for the patient; and a proper adjustment of the tube to the patient, that the parallel rays may be used as much as possible in the examination. The apparatus exploited by German manufacturers appears too cumbersome and expensive for any but large or endowed hospitals. Keinbock (1) however describes

a comparatively simple orthodiagraph that should attract favorable attention. Briefly, it consists of a tube-holder and diaphragm, swung from one set of pulleys attached on the ceiling of the room, and the fluorescent screen, similarly attached, at such a distance from each other that the patient and a supporting frame may be interposed. Such a construction permits the apparatus to be raised out of the way when not in use. The radioscopic device reported by Pfahler (2) has the advantage of the tube being enclosed in a lead box, thus giving more perfect protection. Groedel (3) reports a more elaborate orthodiagraph which permits the examination of the patient in both the horizontal and vertical positions.

The extent of this diagnostic field of the ray is aptly described by Carl Beck (4). He emphasizes the use of the roentgen screen in the early stages of lung tuberculosis, solidifications and atelectasis. The recognition of cavities, abscess and gangrene is discussed. The diagnosis and recognition of foreign bodies is elaborated upon, both from the roentgen and surgical standpoint. Beck writes encouragingly of the value of the ray in the localization, and knowledge of the extent of the lesion, to be gained by the roentgen method of examination.

Emil Beck (5) describes a method for the roentgen diagnosis of fistulous tracts and abscess cavities in the lungs with a paste of bismuth and vaselin. His technique is described as follows: "The fistula should be first dried out, if possible, by packing into its depth a strip of plain gauze, one-half to one inch wide. The gauze is withdrawn just before the injection of the paste. The emulsion (bismuth subnitrate, oz. j to vaselin, oz. jj.—Mix while boiling) is sterilized before using, and the syringe is charged while the emulsion is hot and liquid. A glass syringe, with a nozzle similar to that of a Valentine irrigating tip, should then be loaded with the bismuth paste and tightly pressed against the fistulous opening; the emulsion is forced in very slowly, until the patient begins to complain of pressure. The syringe is then removed and a small gauze is quickly pressed against the opening to prevent the escape of the paste until it has hardened sufficiently. An ice-bag may be applied to hasten the hardening of the material." Emil Beck states the following conclusions: 1. A successful operation of fistulous tracts depends principally on the exact knowledge of the extent and direction of the sinuses before the operation is undertaken. 2. Radiographs taken after the fistulas have been injected with bismuth paste show the extent and direction of the fistulous tracts. 3. Skiagraphs of all fistulous tracts should be taken before an operation is decided upon. 4. Fistulous tracts, tubercular sinuses, or abscess cavities, including empyema, can be cured by the injection of bismuth paste. Several other conclusions relate his successful treatment of sinuses with these emulsions.

Lange (6) gives an interesting review of the relations of the diaphragm, as revealed by the roentgen ray, in pathologic conditions of the thoracic contents. The article is graphically enriched with diagrams illustrating phrenic levels in different thoracic lesions.

NEPHRITIS IN CHILDHOOD.

A REVIEW OF RECENT LITERATURE.

By Alfred Friedlander, M. D.

1. Significance of Albumen and Casts in the Urine of Children.—Sondern (*Archives of Pediatrics,* February, 1907).

2. Oedema in the Newly Born and in the Infant.—D'Astros (Rev. *Mens. des Mal. de L 'Enf.*, September, 1907).
3. Nephritis in Infancy.—Carpenter (*British Jour. Chil. Dis.*, October, 1907).
4. Nephritis and Impetigo.—Guinon and Pater (Rev. *Men. des Mal. de L'Enf.*, November, 1906).
5. Nephritis Complicating Roetheln.—Vincent (*Prov. Med.*, 1907, No. 41).
6. Acute Hemorrhagic Nephritis after Parotitis.—Jelski (*Archiv. f. Kinderheilk.* Vol. 47, page 164).
7. Prophylaxis of Scarlatinal Nephritis.—Thompson (*Edin. Med. Jour.*, February, 1907).
8. Ibid.—Royer (*Therapeutic Gazette*, January 15, 1907).
9. Alimentary Regimen in Scarlet.—Courdouan (*These de Paris*, 1907).
10. Zur Familiaren Hauffung d. Scharlachnephritis.—Spieler (*Jahrbuch. f. Kinderheilk.*, 1906).
11. Ueber Plotzliche Heilung von Acute Nephritis nach Uraemie.—Eichorst (*Med. Klinik.*, 1906, No. 35).
12. Behandling d. Uraemie in Kindesalter.—Heubner (*Charite Annalen*, XXIX Jahrgang).

In a very suggestive article, Sondern[1] points out that in the acute nephritis of infancy and childhood, casts may be absolutely missing during the first few days, while in the chronic cases albumen may be absent at times. The quantity of albumen and the numbers of casts are not always of value in determining the degree of inflammation present. And again, it is noteworthy that the differential diagnosis between transitory and nephritic albuminuria is not easy. Many conditions not dependent upon renal lesion, may cause albuminuria with casts. Thus it is well known that in recurrent vomiting, and in cases of acidosis, albumen and casts, may occur without nephritis. Again, in intestinal auto-intoxication a similar condition may obtain. D'Astros[2] has shown that in the newly-born, an acute infection of septicæmic nature may attack the kidneys, whose powers of elimination are thus reduced. The diagnosis of the cause of the rapidly ensuing edema may for a time be decidedly difficult, inasmuch as casts may, in the early stages, be entirely wanting. Altogether, it is apparent that the laboratory examination of the urine in early infancy is not sufficient for a diagnosis. Clinical observation is also necessary. On the other hand there can be no doubt that a more frequent or routine examination of the urine in infancy, would lead to the detection of many renal abnormalities. Long ago Jacobi made the assertion that pyelitis was one of the most frequently overlooked diseases of early life.

In 62 infants, ranging in age from 3 weeks to 8 months, Carpenter[3] found albuminuria only twice. The patients had been brought to the outpatient department for a variety of causes. He finds that dropsy is especially frequent in the newly born and then later on in the first year of life (age of gastro intestinal disturbance): But in this latter type, albuminuria is rare. Stoeltzner holds that edema occurring after the acute infections, always shows inflammatory conditions in the kidneys; though about this there is no agreement among various observers. Carpenter reports a typical case of renal inadequacy without kidney lesion macroscopically or microscopically. Carpenter also emphasizes the fact that cases of nephritis are apt to be overlooked clinically, inasmuch as extensive kidney disease may exist in infancy

without dropsy. One etiologic factor of importance in the nephritis of infancy is congenital lues; but there is no doubt that interstitial nephritis in infancy may be produced by toxines other than those of lues (e. g. intestinal toxines). The possibility of the seeds of this disorder of nephritis being sown in early life must be borne in mind. That certain individuals and therefore certain families show predisposition to kidney lesion has long been known. Spieler[10] has shown an interesting statistical series of familial predisposition to scarlatinal nephritis. In 35 families, he had 83 children showing cases of scarlatinal nephritis, this evincing a familial lack of renal resistance. Guinon and Pater[4] report three cases of acute nephritis occurring in the course of impetiginous eczema, the infection doubtless occurring through the diseased skin. Vincent[5] reports a case of acute nephritis in a girl of 15 complicating roetheln, while Jelski,[6] has a case of acute hæmorrhagic nephritis after parotitis in a 7 months nursling. Cases of acute nephritis after inunctions of tar salve and peru balsam, have also been recorded recently.

Thompson[7] discussing the prophylaxis of scarlatinal nephritis, reports the results of his treatment with urotropin. As will be remembered, this treatment was suggested some years ago by Widowitz. The drug is given in appropriate dose from the beginning of the disease to the fourth week. Thompson reported 47 cases so treated without nephritis, which can hardly be considered as proving anything for the treatment. Royer[8] lauds the routine use of chloral hydrate, given in doses sufficient to produce light somnolence throughout the febrile period. Of 800 cases so treated, 5.5% had nephritis; of 756 cases otherwise treated 7.7% had nephritis. Again, one wonders whether this proves very much for the treatment.

Much attention has recently been paid to the question of dietetic prophylaxis of scarlatinal nephritis. The general consensus of opinion is that the absolute milk diet is not absolutely necessary. French observers have laid special stress on the importance of a salt free diet in scarlet. Hutinel and others have insisted that dropsy is to be attributed to retention of the chlorides; that it is therefore important to keep chlorides out of the food as much as possible in the conditions of potential renal irritability. Courdouan[9] after careful study concludes that no special form of dietetic regimen will absolutely prevent the occurrence of scarlatinal nephritis, and this would appear to be the general view. At the same time, experience is showing that insistence upon an absolute milk diet for three or four weeks, is not absolutely necessary. Eichhorst[11] reports two very interesting cases of acute hæmorrhagic scarlatinal nephritis, which after uraemic attacks, suddenly recovered. Eichhorst believes that the uraemia formed a sort of renal crisis the toxic substances passing out of the kidneys into the system, thus producing the uraemia, whereupon the thus detoxified kidneys rapidly recovered. Discussing the treatment of uraemia in childhood, Heubner[12] lays special stress on the virtue of leeches, or venesection, or both. The results of the treatment are gradual, but in many cases surprisingly good. Very often large quantities of blood must be removed. Of 30 cases so treated, 7 died (23%); of 11 cases of uraemia in childhood otherwise treated, 5 died (44%). It will be remembered that, some years ago, Baginsky advocated this treatment of uraemia in childhood very strongly.

GRAVES' DISEASE.

A REVIEW OF RECENT LITERATURE.

By Sidney I. Schwab, M. D.

1. Le Goitre exopthalmique.—(*Rev. Neurolog.* No. 18, 1907).
2. Uber Kropfverpflanzung und experimentellen Morbus Basedowii.—(*Münch. Med. Woch.*, No. 24, 1907).
3. Die Persistenz und Hypertrophie der Thymusdruse bei Basedowscher Krankheit.—(*Münch. med. Woch.*, No. 16, 1907).
4. Publications of Cornell University, Vol. VI.

This abstract will concern itself with the mention of some of the more recent facts that have been added to our knowledge of Graves' disease. There has been a great interest in this disease in the last two or three years. Especially of late has this interest manifested itself by the constantly recurring reference to the subject in the best medical journals. One of the most important needs for the further investigation of the subject is that of animal experimentation. Whether it is possible to reproduce in animals the symptoms of Graves' disease, is an important fact to be established. If the disease can be said to occur in animals naturally, then the field of experimentation is much widened. According to Möbius, who even now must be regarded as one of the best authorities, this disease is found in animals. Sainton (1) has collected all the cases in the literature on this subject. Most of the cases fail to satisfy a critical conception of the symptoms of this disease. Several, however, are very striking, especially that of a horse which presented the characteristics of a Graves' which were relieved in great measure by a partial thyroidectomy.

The possibility of causing Graves' disease in animals experimentally has been often considered. The means thought of have usually had in view the transplantation of the gland into the tissues of animals. The secretion of the thyroid injected into the blood of animals has failed to cause any specially characteristic symptoms. The transference of thyroid glands into the tissues of one animal from that of another has likewise not been followed by symptoms typical of the disease. Pfeiffer (2) attempted to solve the problem by transplanting portions of the thyroid from a case of Graves' disease into the spleen of animals that show a certain tendency towards the development of symptoms similar to those found in Graves'. The only result that would point to the development of the disease was the rapidity of the pulse. The author does not draw any inferences from this experiment but suggests that it is by no means hopeless to develop the experimental studies along lines similar to these.

An interesting point is brought out by the report of Gierke (3) on the persistence of the thymus gland in cases of Graves' disease. It is possible, in some cases, to demonstrate that there exists an enlarged thymus, or a persistent thymus. In such cases, of course, the danger from the operation of thyroidectomy is increased very considerably and it is worth while, in all cases that come to operation, to inquire into this possibility.

The publications by Cornell University, volume VI, contain a series of interesting monographs on the subject of Graves' disease. In them are contained the reports of the preparation of the so-called Beebe-Rogers serum and the results of the treatment so far obtained. This is the most considerable contribution to the subject that has appeared re-

cently. Among these papers is an interesting study of the pathology of Graves' disease from the point of view of serum therapy. Ewing draws the following conclusions that tell rather directly against the assumption that the serum therapy is a logical method of treatment. 1. It is by no means shown that the thyroid is the sole and primary location of the disease. 2. The relation of the parthyroids to the thyroid is not understood. It is perhaps likely that the parathyroids exert a certain influence upon the thyroid gland itself so that efforts directed to modify this influence may be dangerous. 3. It is possible that the hypophysis exerts more of an influence on the causation of this disease than was formerly thought. In some cases changes in the hypophysis were found. 4. The changes in the gland itself, in certain severe cases, appear to place limits upon the notion of serum therapy. The chief objection to the idea of serum therapy lies in the fact that there are changes in the other organs which, by no manner of reason, can be influenced by serum derived from the gland alone.

Papers dealing with the results of various kinds of therapy are very numerous. The results of the treatment by the Rogers-Beebe serum is reported by Rogers. This serum, as is well known, is prepared by injecting the thyroglobulin and the nucleoproteid of a thyroid gland from a case of Graves' disease into dogs or sheep. There is formed in these animals an antibody and a cytotoxin which is removed from the animal by bleeding. This is injected into the blood of a patient suffering from the disease. Of ninety cases so treated twenty-three were apparently cured, fifty-two were improved, eleven were uninfluenced and four died. This result is scarcely better than is obtained by any of the methods so far used. The result certainly cannot compare to that obtained by the surgical treatment. The results obtained by the Möbius serum and the so-called thyroidectine made in this country, are too indefinite and are based upon too few cases to admit of any general conclusion. It is extremely doubtful if the serums alone can be said to exert any positive influence one way or another. The many good results reported by various authors with the x ray, electricity, etc., are upon close examination very unsatisfactory. The number of cases are much too small and the duration of observation much too short. The probability is that patients who are said to have recovered by these means would have recovered under any sort of treatment. It must not be forgotten that certain cases have a tendency to get well and that there is besides a marked variation and periodicity in the recurrence and disappearance of symptoms. Then again it is frequently observed that the thyroid gland causes a group of symptoms similar to Graves' as a kind of physiologic variation from the normal, owing to the temporary hyperactivity of the gland due to absolutely normal causes. Surgery has shown the greatest number of positive cures. The large statistics from the Kocher clinic, and the Mayo clinic in this country, together with those of numerous individual operators, show a percentage of recoveries from 55 to 75 per cent. This is far better than any form of serum or other treatment can show.

CORRESPONDENCE.

THE DUTY OF THE MEDICAL PROFESSION IN RESPECT TO EDDYISM—SO-CALLED "CHRISTIAN SCIENCE."

A Letter From Charles A. Todd, A. M., M. D.

To the Editor:

It is with great satisfaction that one reads in the February number of the Interstate Medical Journal the editorial commenting upon the more than extraordinary inanities and mischievous absurdities of the latest exploiter of human credulity, Mrs. Eddy. Poor Humanity, in its blind strivings to tear away the veil that hides the ultimate nature of things, ever the victim of presumptuous charlatanry and conceited ignorance!

The recent death of a well known citizen, a close friend of mine, while in the hands of a "Christian Science healer," puts a moral obligation on me to write this protest and earnestly to ask if it is not high time for the profession to take effective measures to dam the progress of this epidemic of Eddyism. The extensive spread of this epidemic is explicable by reason of the cult being based on homoeopathy; from the fact that its founder is a woman; and that its self-bestowed name of "Christian Science" is a most seductive catch-word: Did not Christ cure by miracle? For those not initiated it is more than difficult to credit a woman three times married, divorced once, who deserted her only child, and who within comparatively a few years has gained a large fortune through the sale of oracles, tithes and fees, with the spiritual power of Him who vowed to proverty, gave of his inner wealth freely without money and without price and on his painful way to Calvary had no where to lay his homeless head. Also, it is to be suspected that the methods of public and much of private education in the United States tends rather to favor superficiality of thought than to develop the power to weigh evidence judicially and thereby arrive at sound conclusions. By no means is to be omitted this additional reason: Mrs. Eddy insists that through the mere reading of her book (the Eddy bible) cancer, consumption, all disease may be promptly eradicated and the reader in turn graduated to go forth a competent "healer." To the ignorant and to those not well balanced in mind (who, even in high places, are more numerous than suspected), such an appeal is irresistible. When there are so many of social and mental position who will publicly profess Eddyism and positively deny the possibility even of the existence of pain, of sickness, of disease in any form and boldly attempt to put their insane notions into action at the cost of human life and in defiance at times of our sanitary laws, then surely the duty of the profession is made more than plain. A few years ago there broke out in the Eddyite school in St. Louis an epidemic of smallpox. The disease was allowed to run its course until a teacher and a number of pupils fell sick. Here, evidently, was an acute contagious disease and we have a well-known law requiring all such to be promptly reported for the protection of the city. Yet this epidemic became known to the authorities purely through chance. One of the pupils, not a boarder, sickening at home, an investigation as to the cause of this plague was at once made and traced to the school, which then

was taken in hand as the law provides; some of the cases were already in the last stage. How many cases of diphtheria, scarlet fever and other scourges of the nursery are likely to be hidden away in just such reckless and criminal fashion to the inestimable danger of their several neighborhoods. My friend, Mr. C., was a man of specially robust constitution, strictly temperate, the active head of a large business. One who could rightly anticipate years of prosperous life, yet he now fills a most untimely grave, due to death by "Christian Science." His wife was a fanatical devotee to that ism and well-known as a "healer." She, too, was of most vigorous frame and of equally vigorous will power. The question of Eddyism has long been a matter of dispute between them. Mr. C. in his occasional visits at my house would ridicule its gross pretensions and deplored the harm it had worked in his own household. He stopped his wife from "practicing" in an office, but out of his great affection did not venture to proceed further. We last met in January, when he complained of being sick of grippe and asked me if it were not a germ disease. I assured him that it was, and, fearing his wife's interference, warned him impressively by no means to neglect his condition. At the time there was a severe epidemic of that treacherous disease. Only sixteen days later his friends were shocked at reading the notice of his death. Grippe-pneumonia was on the death record. "Christian Science" had marked him for its own, with the natural result. Grippe-pneumonia does not recognize the exorcisms of Mrs. Eddy. Some years ago a married pair in Connecticut conceived the insane idea that, like Abraham, they were called upon to sacrifice their only son, which they did, no providential ram appearing. Is there any essential difference between the two instances? Such *assisted* death doubtless occurs daily. Ought the profession to allow the thousands of "Christian Science healers" scattered over the land, illegally to usurp its sacred office and unchecked to be the reckless purveyors of death?

Doctors have long taught that many of our sicknesses are but the outcome of self-indulgence, physical or mental, and are to be thrown off by will power and regimen. But Eddyism in its presumptuous ignorance has the reckless hardihood to deny facts about disease, that have been demonstrated with the absolute certainly of mathematical proof. An Eddyite occupying a public position of importance, when asked how he explained the glorious victory achieved in Cuba and Panama in eradicating yellow fever by extermination of the germ-bearing mosquito, quite easily met the difficulty by resolutely declaring that he "did not believe a word of it." Such must consistently be the very rational stand to be taken by the worshippers of Mrs. Eddy in regard to all those grand discoveries that have made possible modern surgery and so much of the most valuable of our therapeutics. Such a mental attitude belongs to a cult of the dark ages of superstitution and blind credulity, rather than to one born in our own times, yet it is what we have to reckon with. For the benefit of one branch of medicine, I cannot refrain from quoting here this choice excerpt from the Eddy bible (Science and Health. Last edition, p. 528. Copyrighted. Price $3.00). Mrs. Eddy commenting on the excision of Adam's rib during his sleep, out of which to create Eve: "Here falsity, error credits Truth, God with inducing a sleep or hypnotic state in Adam, in order to create woman; this is the first record of Magnetism." (Magnetism is persona non grata). "According to this narrative surgery was first performed mentally, and without instruments; and this may be a useful hint to the medical faculty." It might be here stated that Mrs. Eddy is severe on our common ancestor. She says (ibid. p. 338): "Divide the name Adam into two syllables and it reads, a dam, or obstruction. This suggests the thought of something

fluid, of mortal mind in solution. * * Here *a dam* is not a mere play upon words, for it means much. It illustrates the separation of man from God, etc." Adam also is defined (ibid. p. 579): Error; a falsity; the belief in original sin, sickness and death; a curse, etc.

Publicity, full and uncompromising is the means of coping with Eddyism. Demonstrate in open court both the crass absurdity of its claims as a mode of cure and its constant danger to the community through its obstinate denial of the existence of disease, contagious as well as other. If necessary let a law be passed empowering any one in case of a death under the hands of a "Christian Science healer," or any other such illegal practitioner, to demand that a coroner's inquest be held, even should a licensed practitioner of medicine have been called in, for it is a common opinion that such a course not infrequently is taken to secure the burial certificate and to avoid an inquest. That is, in *order to avoid publicity*—the very thing we argue. The court proceedings should be published in at least one daily paper and be open to all. Should a licensed doctor of medicine appear in the case he should be summoned before the court to testify as to his status in the case: In what condition he found the patient, and what was his own course; whether he had stood by a passive spectator or had interfered according to his sworn duty as a certified practitioner and applied the suitable remedies. Under the latter supposition he would stand exonerated, but the Eddyites in charge would be convicted publicly of palpable double dealing, an accusation not easy to bear by any self-respecting person. For Mrs. Eddy specially anathematizes such: "Take heed: We regret to be obliged to say that all are not Christian Scientists who call themselves so. Charlatanism, fraud and malice are geting into the ranks of the good and pure. This evil obtains in the false teaching and false practice of the science of treating disease through the mind. The silent address of a malpractitioner can only be portrayed in these words of the Apostle: 'Whisperers, the poison of asps, is under their tongue.'" This is a close parallel to Hahnemann's anathema against so-called homoeopathists who do not strictly hold to his infinitesimal dosage. An exploded doctrine, yet the *basis* of Mrs. Eddy's wonderful "discovery." But should the doctor have suffered himself to have been used as a mere buffer between the malpractice and the law, then should he not be forced by the Board of Health to show cause why his certificate should not be revoked as having been convicted of deliberately and knowingly conniving at malpractice? One such renegade example thoroughly exposed and punished by the revocation of his license would effectively put an end to such shameful prostitution of an honorable diploma. Should there be found in St. Louis any one who has so little sense of common decency as to affix to his title M. D. the letters C. S., meaning Christian Science practitioner; a man who publicly advertises himself as denouncing all belief in the existence of disease in any form and in the efficacy of medicine, daring at the same time to advertise himself as a doctor of medicine, can self-stultification go further? Ought he be allowed thus to attempt to bring the honorable title of M. D. into common disrepute? There may be some among the laity who would cry out that such action as is here advised would be an invasion of privacy and so "unconstitutional," and other dreadful things. Then equally to charter medical colleges, to prescribe a definite term of study; to license practitioners, should be unconstitutional. Such restrictions are permissible only on the ground that they are demanded by and for the public well-being—*Salus populi suprema lex.* New conditions require new laws. That a cult should spread extensively over our land which denies in toto the possibility even of the existence of dis-

ease and contagion, as well as the need of the simplest medical cure, constitutes a new condition at once extraordinary and dangerous in the extreme, so far as its teachings are put in actual practice.

Suppose in the case of the unhappy Mr. C. an inquest had been held and upon the body the usual lesions of grippe-pneumonia demonstrated: consolidated lungs, congested brain, and other grave conditions, all indicated during life by the consuming fever, racking pain, choking cough and finally delirium to close the sad scene. The cause of death being thus clearly established then follows a searching examination of those in charge of the sick man as to his treatment. The scheme of "Christian Science" treatment rigorously requires that the patient should be forced, debilitated and suffering intensely though he may be from the grippe poison, to be kept dressed and about; by no means to be allowed to act the sick man, or in the least to obey the warning demands of nature to economize and fortify his strength; he must "have faith" is dinned into his throbbing brain with crazing iteration. "There is no such thing as pain, or sickness—all 'mortal mind,' my friend." A mad dog with frothing jaws rushes at you; a tottering wall is about to fall upon you—stand firm, all "mortal mind, Adamic error." Would the public long tolerate such fanatical human sacrifice?

To conclude, I take the liberty to suggest as an initial step in protecting the public and the profession from the very positive evils of Eddyism, that the St. Louis Medical Society make the consideration of its suppression a special order of business. The foregoing is respectfully submitted as a possible plan of campaign. The profession should not defer action longer and suffer this insidious epidemic of Eddyism to gain more ground and to become correspondingly more and more reckless as to health and life and at the same time more difficult to eradicate.

Charles A. Todd, A. M., M. D.

OBITER DICTA FROM FOREIGN JOURNALS.

FOUNDER OF THE RED CROSS.

Joannes Henricus Dunant, the founder of the Convention of Genève and of the Red Cross, we learn from the *Münch. med. Wochenschrift,* will celebrate his 80th birthday on the 8th of May. The occasion will be made memorable, and the name of the founder of the Red Cross and promoter of the Genève Convention perpetuated, by a beautiful medallion made by Mayer and Wilhelm of Stuttgart. The obverse of the medallion will bear the inscription "Joannes Henricus Dunant, natus 8 V, 1828." On the reverse side the following will appear: "Joannes Henricus Dunant, Fundatur operis Crucis Rubrae, 1863; Promoter Conventionis Genevensis, 1864."

THE INSTITUTION FOR CANCER RESEARCH IN BERLIN.

Dr. O. C. Wijnhausen, in "Het Nederlandsch Tijdschrift voor geneeskunde," gives a description of the Berlin Institution for Cancer Research, which is in charge of Professor Leyden. It is the oldest institution of this character in Germany and enjoys many advantages over others of a similar kind. It always has a sufficient number of patients, contains every facility and abundant instrumentarium for laboratory research, while connection with surgical clinics is kept up constantly. The institution is located in the Charité Hospital, so that patients are always plentiful. It consists of three barracks, of which two are used for the nursing of patients and one for laboratory research. They are all newly built and up-to-date as to hygienic features and have room for twenty-two patients. All the patients suffer from inoperable cancers or have been operated upon for cancer. Most of the patients do not know that they are suffering from cancer and everything is done to keep this knowledge from them. The writer saw one patient who had been operated upon for cancer of the pharynx and larynx; larynx, pharynx and tongue had been resected, two openings could be seen just above the manubrium sterni leading into the trachea and esophagus; deep in the wound the spinal column was visible, and high up the palate —a masterpiece of surgical technique, but—is not death preferable to such a life?

The treatment carried out consists of a dietetic, local and specific therapy. First: The dietetic treatment consists in a feeding, specially prepared for every case in particular, in which milk and cream take a first place, the effort being to supply more calories than the patient needs for his existence. Meat is not omitted from the diet list in the Berlin Institution as is done in similar institutions in other cities. By this method most of the patients gain in weight and complications may be prevented. For instance, patients suffering from cancer of the bladder or uterus, will not have a perforation of the carcinoma into neighboring organs so soon when the affected organ is surrounded by fat.

Second: If possible local treatment is applied. Cancers of the skin are cauterized with zinc chloride, cancers of the esophagus are treated locally with trypsin or pancreatin. Third: Medical and specific treatment. Patients are treated in different ways. Some get large doses of atoxyl, others get a serum, obtained from sheep or an extract of rabbit's liver. This last treatment is based on the fact that primary cancers are practically never found in the liver. Von Leyden and Bergell noticed a specific action of this liver extract in cancer in mice. Radium has been tried but without results.

What has been gained so far by this treatment? According to Prof. Leyden, patients in the institution are kept alive much longer than would be possible under ordinary circumstances, less complications and metastases are seen. In case of young metastasis, these have often been seen to disappear under the serum treatment. An interesting case in the institution is the one of a patient in which a cancer metastasis appeared in the spinal column after operation for cancer of the breast. This patient has now been treated with serum for five years with the result that the disease came to a standstill and new metastases have not appeared. Influence on the primary cancer has so far not been observed under serum treatment. Cancer in the male progresses much quicker than in the female, a fact observed time and time again.

Assistants in the institution are Prof. Lazarus for therapy, Prof. Bergell for chemical research and Prof. Lewin for experimental research, while the daily care of the patients is in the hands of a voluntary assistant.

BIER'S HYPERAEMIA.

Dr. Wohlgemuth writes from Tsumeb in South West Africa to the *Deutsche Medicinische Wochenschrift* that the Ovambos have used Bier's methods for a long time. In dermatitis, abscesses, deep-seated pains, etc., they apply a sucking apparatus to the affected part. The apparatus consists of a cow's horn, the point of which has been filed off. The Ovambo medical man places the broad opening of the horn over the affected part, while he puts the point in his mouth; upon the end of his index finger a piece of clay is adhered. He now makes a deep inspiration, causing as much of a vacuum in the horn as possible. The piece of clay is applied over the opening at the point and the horn hangs to the part as a modern cupping glass would do. In case of phlegmons, they tie a string of elastic grass above the affected part of the limb in such a way that little edema follows. The hyperaemia is maintained for from 12 to 24 hours.

HISTORICAL NOTES.

"REMAINS" OF SAMUEL BARTLETT PARRIS, M. D.

Samuel Bartlett Parris (1806-1827) was a physician, a poet and a promising medical writer. A collection of his miscellaneous essays and poems was published at Plymouth, Mass., in 1829. This volume shows how great a loss to the republic of letters was the early death of Dr. Parris. In his poem, *Anticipations and Recollections,* he speaks of the

"fears, anxieties and cares
Which ev'ry one must know, who boldly dares
Attempt the noble task to blunt the fangs
Of fell disease, and soothe the suffer's pangs."

Parris's Tribute to Hippocrates.

"Such was 'the Coan sage.' By schools untaught,
On Nature's page he for her precepts sought;
With eye observant marked each wayward change
In maladies of frightful shapes, and strange,
And gave to ages of succeeding date
His labours to admire and imitate.
Nor less his *patriotic* virtues shine;
In vain might honour, wealth and power combine,
To tempt his footsteps to a foreign land—
He all their bright allurements could withstand,
For far surpassing wealth and power he viewed
The noble consciousness of rectitude."

Parris's Lines to Jenner.

"Oh! for some genius, Jenner, great as thine,
To quench the venom of that power malign.
Thine was the glorious work, and thine the skill,
To stop one mighty flood of human ill.
Ages had rolled on ages, while the scourge
From mourning friends had called the frequent dirge;
Empires had trembled, when they saw with dread
The dreadful weapon brandished o'er their head;
Thousands before its path made haste to fly,
Only to spread its sure mortality.
Its touch dissevered every sacred bond
That binds the spirit in attachments fond;
The objects of its wrath were shunned with fear,
E'en those, to whom their welfare was most dear,
Avoided their approach with horror wild,
As though by fiend-like crimes they were defiled.
If by no care for her own life restrained,
The mother with her sickening child remained,
She bought the privilege with life alone—
To save her child's she sacrificed her own;
And even that price in vain was often paid,
And child and mother in one grave were laid.

Oh! fearful and heart-rending was the cry
Of nations whelmed with this calamity,
When Heaven in pity looked upon their woes—
It gave the mighty word, and Jenner rose;
The demon of the pestilence beheld,
And by his heaven-directed power compelled,
Dropped from her hand the vengeance-whetted blade
And fled his presence, trembling and dismayed.
Now she has ceased the shrinking throng to force
To death's dark vale, along their downward course.
Closed are those gaping portals of the tomb,
Through which she drove the thousands to their doom.
None but her rash and willing slaves expire,
Self immolated to her vengeful ire.

Immortal Jenner! Were thy name enrolled
On every heart in characters of gold,
'Twere but the homage justly due thy deeds,
Whose worth all calculations far exceeds.
Hadst thou upraised the desolating sword,
And o'er the earth thy slaught'ring legions poured,
Until thy thirst for conquest sacrificed
As many as thy genius has devised
To rescue from the grave—thy name had shone
With those of Cæsar and Napoleon,
High on the list of those, whose deeds sublime
Of glorious murder and heroic crime
Have given them acknowledged right to claim
The death-earned glory of the victor's name.
But no such brightness now is round thee thrown;
Even thy name to those alone is known,
Whom studies of the healing art engage,
While plodding o'er the weary midnight page;
Yet, who would not exchange the blood-bought crown,
And all the conq'ror's ill-deserved renown,
To purchase thy proud consciousness of worth,
Richer than all the diadems on earth?"

BOOK REVIEWS.

PROGRESSIVE MEDICINE. Vol. I, March, 1908. A quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Octavo, 284 pages, with 11 engravings. Per annum in four cloth-bound volumes, $9.00; in paper binding, $6.00, carriage paid to any address. Lea & Febiger, Publishers, Philadelphia and New York.

The March issue of Progressive Medicine deals with the following five branches of medicine: Surgery of the Head, Neck and Thorax, by Charles H. Frazier; Infectious Diseases, Acute Rheumatism and Croupous Pneumonia, by R. B. Preble; Diseases of Children, by F. M. Crandall; Rhinology and Laryngology, by D. Braden Kyle, and finally Otology, by A. B. Duel.

It is well known that in these reviews both the scientific and practical side of each of the various specialties of medicine is thoroughly covered by writers of recognized authority.

THE SEXUAL INSTINCT. Its Use and Dangers as Affecting Heredity and Morals. By James Foster Scott, A. B. (Yale), M. D. Publishers: E. B. Treat & Co., New York. Price, $2.00.

The aim of this new contribution to the ever-increasing literature on sexual problems, is clearly stated by the author in the preface to this very interesting and instructive volume. "This book," he says, "contains much plain talking for which I offer no defense. Its justification will be found in the body of the work, designed to furnish the non-professional man with a sufficiently thorough knowledge pertaining to the sexual sphere."

It is another attempt to present this difficult subject to the laity in an intelligible manner. There cannot be any doubt concerning the necessity of a better information of the laity, but no two men will agree as to how much information is necessary. And therein lies the difficulty. "Necessary" information can never be immoral, but if certain details, anomalies, etc., are described with "unnecessary" accuracy and illustrated with numerous case reports, the reader at once will suspect some condemnable attempt to make the book not only valuable but also "attractive;" such an attempt will stamp it as immoral. We wish to emphasize that the volume before us is high above any such suspicion.

In the reviewer's opinion some of the chapters present their respective subjects in a form which stands unequalled, but others seem not quite clear, or emphasize too forcibly the religious point of view, which, however, we readily admit cannot be entirely omitted in a thorough consideration of the sexual instinct in all its various aspects.

WURZBURGER ABHANDLUNGEN AUS DEM GESAMTGEBIET DER PRAKTISCHEN MEDIZIN. DIE RACHITIS. Von Dr. B. Gutmann, Spezialarzt fuer Kinderkrankheiten in Wurzburg. Wurzburg. Curt Kabitzsch (A. Stuber's Verlag). 1908.

This is a short, but very interesting monograph on the ever-attractive subject of rickets. The special feature of note about the presentation is the careful and rather exhaustive summary of the more modern theories as to the pathogenesis of rickets.

LEHRBUCH DER SÄUGLINGSKRANKHEITEN. Von Prof. Dr. med. et phil. Heinrich Finkelstein, Privatdozent und Oberarzt am Waisenhaus und am Kinderasyl der Stadt Berlin. Zweite Hälfte, Abteilung I. Berlin W. 35. Fischer's Medicin. Buchhandlung H. Kornfeld. 1908. Price 4 marks.

This is the first part of the second volume of Finkelstein's text-book of Diseases of Infancy. This work may well be said to represent a perfect epitome of the most advanced present day thought, with reference to the diseases of the first year of life. In this present volume, the diseases of the respiratory tract are considered in great detail. It is of interest to note that such a subject as status lymphaticus which is ordinarily but cursorily handled, is considered very fully. It would appear that cases belonging to this category are not as numerous as the enthusiastic followers of Paltauf would have had us believe. Finkelstein's theory that many of these cases belong in his category of alimen-

tary intoxication, is most interestingly if not altogether convincingly set forth. The diseases of the circulatory and gastro-intestinal systems are set forth with much clearness and with a remarkable wealth of detail. One has but to look at the immense number of literary references found in the book, to be convinced of the author's wide reading. And a study of its pages shows him to have used his immense clinical experiences to the best advantage in addition.

THE COMMONER DISEASES OF THE EYE: HOW TO DETECT AND HOW TO TREAT THEM. By Casey A. Wood, M. D., and Thomas A. Woodruff, M. D. Third edition, enlarged and improved, with index. Chicago: W. T. Keener & Co.

The third edition of this very useful and practical little hand-book for the physician in general practice, contains several new chapters dealing with the physiology, histology and gross anatomy of the orbit and its contents.

Dr. Frank Brawley has contributed a chapter on the relation of affections of the accessory sinuses to diseases of the eye.

The little work has now reached the respectable size of 598 pages, and is replete with thoroughly practical information for the general practitioner who is called upon to handle the commoner diseases of the eye. The teaching is sound and well abreast of present day ophthalmic therapeutic ideas.

LIGHT AND X RAY TREATMENT OF SKIN DISEASES. By Malcolm Morris and S. Ernest Dore. Price $1.50 net. Chicago: W. T. Keener & Co., 1907.

This little book is a concise summary of the methods of application and results of Finsen's light treatment, x ray ,and other therapeutic agencies which have been introduced into dermatological practice within the last ten or twelve years. It is mainly based on the authors' experiences, but the work of others in the same field is not overlooked. The great value of the book is fund in the large amount of personal experience of the authors, on which their advice as to treatment is based.

THE SKIN AFFECTIONS OF CHILDHOOD, WITH SPECIAL REFERENCE TO THOSE OF MORE COMMON OCCURRENCE AND THEIR DIAGNOSIS AND TREATMENT. By H. G. Adamson, M. D., Lond., M. R. C. P., London, 1907. Oxford Medical Publications, Oxford University Press; American Branch, New York City.

A great many diseases of the skin are most often seen in children, some are met with only in childhood, while many affections, when occurring in children, are modified in the distribution and grouping of their lesions, so that they present altogether different appearances. From the practical side—from a clinical point of view, and as regards diagnosis and treatment—it is therefore an advantage to consider the diseases of the skin in children apart from the same in adults. This reasoning induced the author to write this book, which is the first one based on the facts mentioned. It is decidedly a valuable addition to our dermatological literature. General practitioners and especially specialists in children's diseases, who have to treat skin diseases in children, cannot find a better book to guide them in this part of their work.

DR. JESSNER'S DERMATOLOGISCHE VORTRÄGE FÜR PRAKTIKER. Dritte Verbesserte Auflage, 1908. A Stuber's Verlag (Curt Kabitzsch) in Würzburg.

The lecture of Dr. Jessner in Königsberg on different dermatological subjects, may be had separately and in book form. They are written for the general practitioner and postgraduate students, and give in a very readable way a review of the large subject of skin diseases. This third edition has been revised thoroughly and can be recommended to the general practitioner who wants to make a more thorough study of dermatology.

A MANUAL OF VENEREAL DISEASES. By Officers of the Royal British Army Medical Corps: Sir Alfred Keogh, Lieut.-Colonel C. H. Melville, Lieut.-Colonel Leishman, and Major C. E. Pollock. London, 1907. Oxford Medical Publications, Oxford University Press; American Branch, New York City.

This work is not intended as an exhaustive treatise or to compete with any of the great systematic works on the subject of venereal disease, but merely to act as a convenient manual for the use of the Army Medical Officer, to assist him in his daily work in the prevention and treatment of venereal diseases. This is what the authors claim for their work. We would add that not only military surgeons but every physician who has not the time to read all that is printed on this subject, and desires a clear, short and practical review of the treatment and prevention of venereal diseases with an up-to-date view on the subject, will be benefited by reading this little book.